Vol. 904 Number 1

OFFICIAL GAZETTE

of the

UNITED STATES PATENT OFFICE

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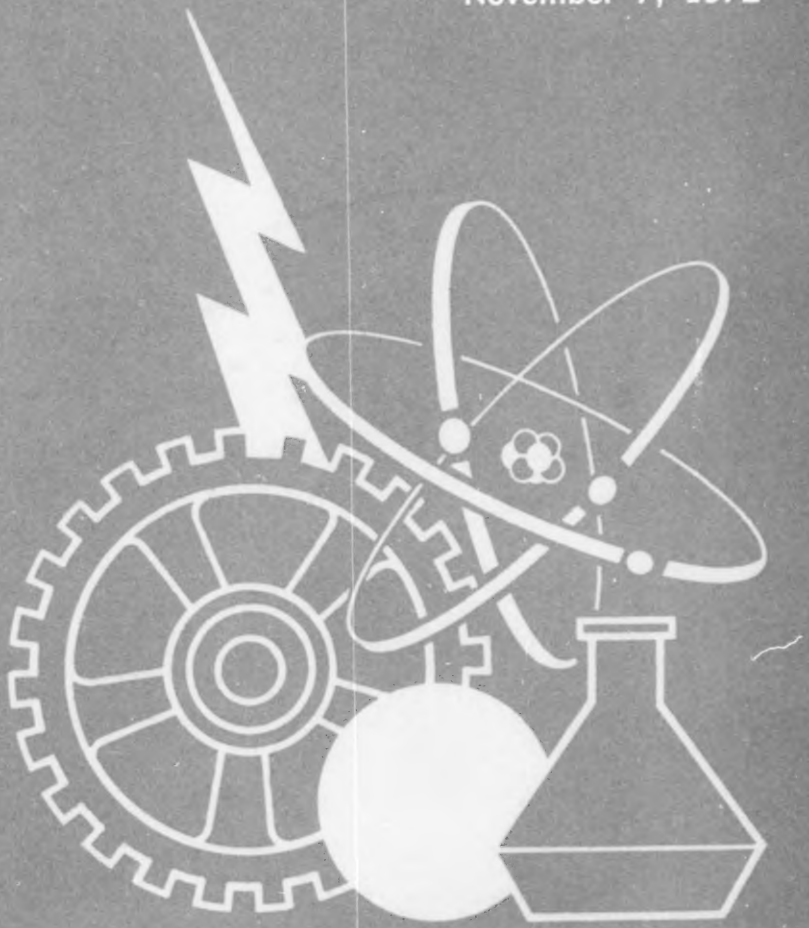
A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

PATENTS

November 7, 1972



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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

November 7, 1972 Volume 904 Number 1

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of Nov. 7, 1972

P.P. 3,136	3,627,021	3,646,340	3,655,494
D. 214,555	3,627,329	3,646,807	3,656,109
D. 217,347	3,628,059	3,646,830	3,656,761
D. 221,161	3,629,038	3,647,793	3,657,175
D. 221,905	3,629,971	3,647,794	3,657,256
D. 223,272	3,630,680	3,648,107	3,657,511
D. 223,382	3,631,607	3,648,251	3,658,851
3,466,652	3,631,916	3,648,638	3,659,586
3,500,162	3,633,276	3,649,095	3,659,968
3,538,294	3,633,385	3,649,144	3,660,040
3,542,361	3,634,147	3,649,206	3,660,121
3,550,879	3,634,204	3,649,232	3,660,769
3,560,479	3,634,355	3,649,408	3,660,893
3,568,174	3,634,400	3,649,561	3,661,049
3,572,958	3,634,898	3,649,569	3,661,460
3,574,704	3,635,082	3,649,597	3,661,751
3,578,367	3,635,448	3,649,933	3,661,960
3,580,914	3,635,612	3,650,349	3,662,007
3,586,764	3,637,053	3,650,841	3,662,039
3,587,111	3,637,253	3,650,965	3,662,530
3,587,653	3,637,303	3,650,991	3,663,073
3,588,933	3,637,476	3,651,085	3,663,091
3,591,562	3,638,398	3,651,341	3,663,165
3,593,982	3,640,137	3,651,692	3,663,261
3,594,934	3,640,391	3,651,855	3,665,364
3,595,997	3,640,737	3,651,862	3,665,912
3,598,833	3,641,023	3,651,980	3,666,236
3,601,510	3,641,084	3,651,999	3,666,277
3,605,192	3,641,327	3,652,217	3,667,297
3,605,862	3,641,401	3,652,498	3,667,613
3,607,143	3,641,410	3,652,764	3,668,003
3,609,128	3,641,591	3,653,468	3,668,245
3,613,077	3,642,619	3,653,595	3,668,345
3,614,161	3,642,865	3,653,761	3,669,567
3,615,721	3,642,921	3,653,798	3,670,159
3,615,902	3,643,085	3,653,824	3,670,528
3,620,770	3,643,239	3,654,020	3,670,549
3,621,587	3,643,874	3,654,280	3,672,009
3,622,316	3,644,203	3,654,476	3,673,225
3,623,517	3,644,623	3,654,497	3,674,284
3,623,905	3,644,674	3,655,063	3,674,484
3,625,802	3,645,458	3,655,243	3,674,991
3,626,015	3,646,321	3,655,440	

Patents Available for Licensing or Sale

3,570,469. BARBECUE GRILL WITH DISPOSABLE TOP. Denton H. Jones, 3504 S. 100th Ave., Omaha, Nebr., 68124.

3,570,507. FISHING TENT. Morris Kashuba, 1563 Main St., Peckville, Pa., 18452.

3,591,925. LINE ANGLE DEGREE LEVEL INSTRUMENT. Frank Dupin, Box 109, Gurnee, Ill., 60031.

3,602,389. CONTAINER OPENER AND HANDLE ASSEMBLY. David E. Russell, 110 Riverside Axe., Jacksonville, Fla., 32202.

3,633,697. VEHICLE SAFETY DEVICE. Harry Silver, 4810 N. Los Altos Place, Tucson, Ariz., 85704.

3,656,637. INVALID CAR LIFT. Dwane P. Simmons, 7465 Olive Tree Lane, Highland, Calif., 92346.

3,663,580. HALOGEN-CARBONYLOXYL COMPOUNDS OF THE STEROID SERIES. VEB Jenapharm Jena, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,669,434. APPARATUS FOR MELTING PARTICULATE METAL. Kloeckner-Werke AG, Germany. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,680,226. DRAFTING AID. K. Havel, P.O. Box 66, Station "M," Toronto 21, Ontario, Canada.

3,683,924. TONGUE SCRAPER. Lawrence D. Louis, 1612 McKinley Road., Napa, Calif., 94558.

3,684,344. DECORATIVE SPACE-SAVING VANITY. Jean A. Gilinger, 6703 Oaklawn Way, Fair Oaks, Calif., 95628.

3,691,557. SYSTEM FOR IDENTIFYING OBJECTS USING AN ENCODING ARRAY FOR EACH OBJECT. James Constant, 1603 Danbury Drive, Claremont, Calif., 91711.

3,691,755. CLOCK WITH DIGITAL DISPLAY. Pierre Girard. Correspondence to: Stevens, Davis, Miller & Mosher, 1911 Jefferson Davis Highway, Suite 600, Crystall Mall 1, Arlington, Va., 22202.

The following 2 patents are offered by: Robert E. Hall, Arlington, Va. Correspondence to Mrs. A. H. Cravens, 1619 N. Highland St., Arlington, Va., 22201.

2,730,207. COLLAPSIBLE AND HOIST.

2,740,626. AUTOMATIC WINDOW CONTROL.

The White Lily Foods Company is prepared to grant non-exclusive licenses under the following patent.

Inquiries respecting licenses should be addressed to: The White Lily Foods Company, 218 Depot Ave. NE., Knoxville, Tenn., 37901.

3,671,264. PACKAGED MIXES FOR FLAVORED FOOD PRODUCTS AND THE PROCESS OF MAKING THEM.

The General Tire & Rubber Company is prepared to grant non-exclusive licenses at reasonable royalty rates under the following patent.

Inquiries respecting licenses should be addressed to: General Tire & Rubber Company, 1 General St., Akron, Ohio, 44309.

3,574,149. FLAME RETARDANT FLEXIBLE POLYURETHANE FOAMS.

The Department of Health, Education and Welfare is prepared to grant licenses as provided by Title 45 C.F.R. Section 6.3, under the following patents.

Inquiries should be addressed to: Mr. Norman J. Latker, Chief, Patents Branch, % National Institutes of Health, Room 5A03, Westwood Bldg., Bethesda, Md., 20014.

3,677,092. VOLUME METERING APPARATUS FOR CIRCULATORY ASSIST PUMPS.

3,623,960. GLUCOSE DETERMINATION METHOD.

3,678,233. STANDARDIZED SET OF COMPENSATING FILTERS FOR MANTLE-FIELD RADIATION THERAPY.

3,774,818. SYNTHESIS OF A MATERIAL WITH JUVENILE HORMONE ACTIVITY.

3,616,935. PREPARATION OF ANTITHROMBOGENIC SURFACES.

3,692,493. LYMPHOCYTE TRANSPORT BAG.

RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following patents.

Inquiries respecting licenses should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 1133 Avenue of the Americas, New York, N.Y., 10036.

Re. 27,454. INTEGRATED CIRCUIT BIASING ARRANGEMENTS.

3,680,236. ELECTRON TUBE HAVING TAMPER-DETECTABLE LABEL ATTACHED THERETO.

3,681,071. METHOD OF PRESSURE TREATING ELECTROPHOTOGRAPHIC RECORDING ELEMENTS TO CHANGE THEIR SENSITIVITY TO LIGHT.

3,681,110. METHOD OF PRODUCING A LUMINESCENT-SCREEN STRUCTURE INCLUDING LIGHT-EMITTING AND LIGHT-ABSORBING AREAS.

3,681,693. MEASUREMENT OF MAXIMUM DYNAMIC SKEW IN PARALLEL CHANNELS.

3,681,703. LOW LEVEL DC AMPLIFIER WITH AUTOMATIC ZERO OFFSET ADJUSTMENT.

3,681,713. HIGH Q CIRCUITS ON CERAMIC SUBSTRATES.

3,682,784. PROCESS FOR FORMING A CONDUCTIVE DATING ON A SUBSTRATE.

3,682,785. PROCESS FOR FORMING AN ISOLATED CIRCUIT PATTERN ON A CONDUCTIVE SUBSTRATE.

3,683,193. BUCKET BRIGADE SCANNING OF SENSOR ARRAY.

3,683,211. FERRO-ELECTRIC TRANSFORMERS WITH MEANS TO SUPRESS OR LIMIT RESONANT VIBRATIONS.

3,683,240. ELECTROLUMINESCENT SEMICONDUCTOR DEVICE OF GAN.

3,683,254. SERVO SYSTEM WITH NOISE CANCELLATION.

3,683,295. GAS LASER DISCHARGE TUBE.

3,683,298. MICROWAVE APPARATUS USING MULTIPLE AVALANCHE DIODES OPERATING IN THE ANOMALOUS MODE.

3,683,391. ANTENNA SYSTEM FOR TELEVISION RECEPTION WITHIN BOTH THE UHF AND VHF TELEVISION BAND OF FREQUENCIES.

3,684,727. DOPED CALCIUM FLUORIDE AND STRONTIUM FLUORIDE PHOTOCHROMIC COMPOSITIONS.

3,684,825. CONTRAST COMPRESSION CIRCUITS.

3,684,826. SYSTEM FOR RECORD MEDIUM CONTROL AND EDITING.

3,684,899. CAPACITIVE STEERING NETWORKS.

3,684,920. TRANSISTORIZED VERTICAL DEFLECTION CIRCUIT.

3,685,137. METHOD FOR MANUFACTURING WIRE BONDED INTEGRATED CIRCUIT DEVICES.

3,685,857. BOOKBINDING.

3,685,994. PHOTOGRAPHIC METHOD FOR PRINTING A SCREEN STRUCTURE FOR A CATHODE-RAY TUBE.

3,686,080. METHOD OF FABRICATION OF SEMICONDUCTOR DEVICES.

3,686,516. HIGH VOLTAGE PULSE GENERATOR.

3,686,539. GALLIUM ARSENIDE SEMICONDUCTOR DEVICE WITH IMPROVED OHMIC ELECTRODE.

3,686,543. ANGLED ARRAY SEMICONDUCTOR LIGHT SOURCES.

3,686,578. STABILIZED TRANSFERRED ELECTRON AMPLIFIER.

3,686,590. SHEET METAL WAVEGUIDE CONSTRUCTED OF A PAIR OF INTERLOCKING SHEET METAL CHANNELS.

3,686,624. COAX LINE TO STRIP LINE END LAUNCHER.

3,687,722. METHOD OF COATING SELECTIVE AREAS OF THE SURFACE OF A BODY.

3,688,025. RECORDER AND PLAYBACK APPARATUS FOR PULSE WIDTH MODULATED RECORD.

3,688,031. HORIZONTAL OSCILLATOR DISABLING.

3,688,037. SYNCHRONIZING SYSTEM.

3,688,131. TIME DELAY DEVICE.

3,688,153. DEFLECTION CIRCUIT.

3,688,154. A STABLE MULTIVIBRATOR CIRCUIT WITH MEANS FOR ENSURING PROPER STARTING OF OSCILLATIONS.

3,688,198. VHF AND UHF AUTOMATIC GAIN CONTROL CIRCUITRY DERIVED FROM A SINGLE CONTROL VOLTAGE.

3,688,207. HIGH SPEED TUNABLE MASER FOR USE IN RADAR AND COMMUNICATION RECEIVERS.

3,688,264. OPERATION OF FIELD-EFFECT TRANSISTOR CIRCUITS HAVING SUBSTANTIAL DISTRIBUTED CAPACITANCE.

The General Electric Company is prepared to grant nonexclusive licenses under the following 33 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Division Patent Counsel, Space Division, Housewares Business Division, 1285 Boston Ave., Bridgeport, Conn., 06602.

3,577,859. COMBINATION FLATIRON AND INTEGRAL CREASER.

Applications for license under the following patent may be addressed to: Patent Counsel, Mobile Radio Department, General Electric Co., Lynchburg, Va., 24502.

3,676,750. DATA INPUT DEVICE WITH HAND-HELD SELECTIVE CIRCUIT CLOSING MEANS.

Applications for licenses under the following patent may be addressed to: Division Patent Counsel, Space Division, General Electric Co., P.O. Box 8555, Philadelphia, Pa., 19101.

3,689,884. DIGITAL CORRELATOR FOR CALCULATING FIGURE OF MERIT OF COMMUNICATION TRANSMISSION SYSTEM.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, AC Motor & Generator Business Division, General Electric Co., 1 River Road, Bldg. 41, Rm. 106, Schenectady, N.Y., 12345.

3,436,633. REGULATOR SENSING CIRCUIT FOR ALTERNATING CURRENT GENERATOR.

3,611,085. PREVENTING TORQUE PULSATION IN INVERTER-FED POLYPHASE MOTORS.

Applications for license under the following 10 patents may be addressed to: Francis K. Richwine, Patent Counsel, Ordnance Systems Department, General Electric Co., 100 Plastics Ave., Pittsfield, Mass., 01201.

2,774,102. BEAD SETTING METHOD AND APPARATUS.

2,956,435. CONDENSATION NUCLEI DETECTOR.

2,960,869. ARC COMPARATOR.

3,117,841. METHOD AND APPARATUS FOR DETECTING GASES OR VAPORS.

3,489,207. VAPOR-COOLED ELECTRONICS ENCLOSURES.

3,551,747. PULSE WIDTH MODULATED BRIDGE POWER AMPLIFIER PROTECTION CIRCUIT.

3,560,829. PULSE WIDTH MODULATED BRIDGE POWER AMPLIFIER WITH MEMORY AND LOCK-OUT LOGIC.

3,607,805. METHOD AND APPARATUS FOR DETECTING GASES OR VAPORS.

Applications for licenses under the following 18 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Co., Appliance Park, Louisville, Ky., 40225.

2,858,687. CONTROL CIRCUITS FOR AUTOMATIC CLOTHES WASHING MACHINES.

2,983,130. CLOTHES WASHING MACHINE HAVING DRAIN PUMP SYSTEM.

3,480,124. ELECTROMAGNETIC CLUTCH.

3,481,162. WASHING MACHINE.

3,481,163. DISPENSING ARRANGEMENT FOR WASHING MACHINE.

3,481,164. WASHING MACHINE.

3,483,719. CONTROL FOR ELECTROMAGNETIC CLUTCH.

3,506,101. CLUTCH COOLING STRUCTURE.

3,509,394. ELECTROMAGNETIC CLUTCH CONTROL.

3,509,741. LABYRINTH SEAL TUB COVER.

3,513,880. DUAL STAGE VALVE.

3,659,579. COMBINATION BAKING AND BROILING GAS OVEN.

3,659,646. HEAT EXCHANGER CONSTRUCTION.

3,674,359. REFRIGERATOR CABINET WITH REMOVABLE PARTITION.

3,678,698. SIDE-BY-SIDE REFRIGERATOR INCLUDING LOW-COST EVAPORATOR MEANS.

3,678,701. ICE MAKER.

3,679,855. PROTECTIVE BARRIERS FOR WINDOW OF MICROWAVE OVEN DOOR.

3,680,825. FIXTURE FOR USE IN THE FOAM INSULATION OF REFRIGERATOR CABINETS.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF OCTOBER 17, 1972

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-19-71
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Sterolds; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	7-02-71
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	8-09-71
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	7-09-71
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—Director (Vacant). Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-04-71
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	2-23-72
SPECIAL LAWS ADMINISTRATION, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	8-11-71
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	12-01-71
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—Director (Vacant). Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	7-16-71
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-26-71
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts: Household, Personal and Fine Arts.	3-18-71
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-01-71
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	8-02-71
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	9-23-71
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	11-01-71
MISCELLANEOUS CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	8-19-71

Expiration of patents: The patents within the range of numbers indicated below expire during November 1972, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,721,999 to 2,725,557, inclusive
Plant Patents..... Numbers 1,427 to 1,435, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED NOVEMBER 7, 1972

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T904,001

PROCESS FOR THE DISPERSION POLYMERIZATION OF A VINYLIDENE CHLORIDE COPOLYMER

Vernon Charles Haskell, Sleepy Hollow Estates, Va., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Original application July 12, 1967, Ser. No. 652,684. Divided and this application Feb. 27, 1970, Ser. No. 18,391

Int. Cl. C08f *45/28, 15/40*
U.S. Cl. 260—33.6 UA

No Drawing. 15 Pages Specification

A process for preparing a copolymer of vinylidene chloride characterized by spherical particles having an average diameter between about 1 micron and about 5 microns which comprises polymerizing between about 70% and about 85% by weight of vinylidene chloride, between about 10% and about 25% by weight of a monomer selected from the group consisting of methyl acrylate, methyl methacrylate and acrylonitrile, between about 3% and about 6% by weight of an unsaturated monocarboxylic acid selected from the group consisting of acrylic and methacrylic acids, in the presence of from 0.3% to 1.5% by weight, based upon the total weight of said monomers, of a free radical initiator and at a temperature between about 45° C. and about 65° C., in an aliphatic hydrocarbon solvent containing between about 5% and 15%, based upon the total weight of said monomers, of a polymeric dispersing agent comprising a copolymer of an alkyl ester of acrylic acid wherein the alkyl group contains between 4 and 8 carbon atoms with from 0.1% to 2%, by weight of the monomers, of a polymerizable monomer selected from the group consisting of allyl acrylate and allyl methacrylate. Alternatively, the polymerization monomers additionally include about 1% to 3% by weight, based upon the total weight of said monomers, of a cross-linking agent selected from the group consisting of allyl acrylate, allyl methacrylate, ethylene dimethacrylate, glycidyl methacrylate and glycidyl acrylate.

The vinylidene chloride copolymer characterized by the spherical particles can be coated onto a film base such as regenerated cellulose to improve the slip properties of the film base. The coating comprises (a) a first copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer and (b) a second copolymer of vinylidene chloride and at least one other ethylenically unsaturated monomer characterized by spherical particles in the amount of about 0.01 to 1.5 weight percent based on the weight of the first copolymer. These coated films are particularly useful in packaging foods.

T904,002

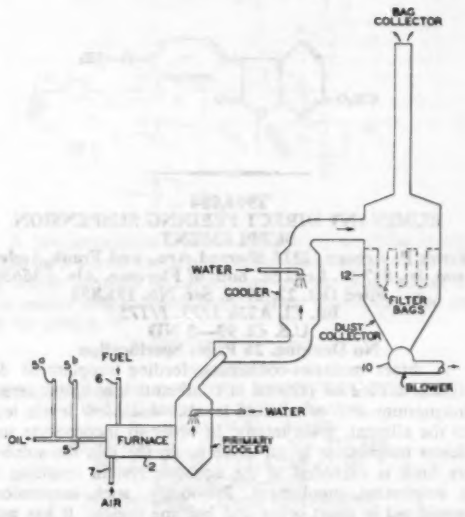
PRODUCTION OF CARBON BLACK FROM DISTILLATE OF RUBBER

Joseph R. Laman and Joseph A. Beckman, Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of abandoned application Ser. No. 826,303, May 8, 1969. This application July 29, 1971, Ser. No. 167,445

Int. Cl. C09c *1/50*
U.S. Cl. 423—450

1 Sheet Drawing. 9 Pages Specification

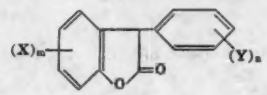


Carbon black is produced from liquid distillate obtained from the distillation of rubber. The distillation may be effected by heating the rubber externally in a suitable retort or the like, or by internal combustion of a part of the rubber with air to produce the necessary heat, limiting the air supply to minimize the conversion of the oil to gases. The distillate may be mixed with other oil before conversion to carbon black in a carbon black furnace. The furnace is heated to the desired temperature by burning either a portion of the distillate and/or fuel gas supplied to the furnace. The carbon black product can be used as semi-reinforcing black and as a filler in rubber products.

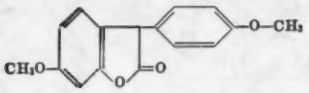
This application is a continuation of application Ser. No. 826,303, filed May 8, 1969, now abandoned.

T904,003
COMPETING COUPLERS
Ilmari F. Salminen, Rochester, N.Y. 14626
Filed Nov. 19, 1971, Ser. No. 190,463
Int. Cl. G03c *7/00, 1/40*
U.S. Cl. 96—56.4
No Drawing. 29 Pages Specification

A class of coumaran-2-one compounds of the formula



wherein X and Y are individually defined as an alkyl group or an alkoxy group; *n* is an integer of 1–5; and *m* is an integer of 0–3; wherein at least one of the Y substituents is substituted in para position on the phenyl ring and wherein X can be defined as both an alkyl group and an alkoxy group on the same ring when *m* is greater than 1, and Y can be defined as both an alkyl group and an alkoxy group on the same ring when *n* is greater than 1. The above-defined compounds have utility as diffusible or non-diffusible competing couplers in the color photographic art as components of a color developer solution, a photographic silver halide emulsion, or corresponding color photographic element. A competing coupler within this class is the compound



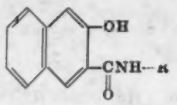
T904,004
RUMINANT DIRECT FEEDING SUSPENSION SUPPLEMENT
Frank P. Achorn, 2315 Sherrod Ave., and Frank Anderson, Jr., 517 W. Lelia St., both of Florence, Ala. 35630
Filed Oct. 22, 1971, Ser. No. 191,853
Int. Cl. A23k *1/22, 1/175*
U.S. Cl. 99—2 ND
No Drawing. 26 Pages Specification

A direct molasses-containing feeding supplement designed to cure or prevent in ruminants low blood serum magnesium and/or calcium levels, which low levels lead to the ailment, grass tetany. In order to incorporate sufficient magnesium as an oxide to do the job, the solubility limit is exceeded in the aqueous system resulting in a suspension supplement. Previously, such suspensions would gel in short order and become useless. It has now been discovered that gelling can be prevented for substantial periods of time if the ammonium polyphosphate solution component of the suspension contains greater than about 70 percent polyphosphate species therein expressed as P_2O_5 including substantial amounts of tripoly.

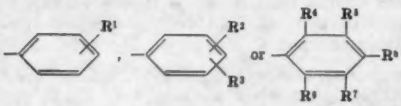
Perhaps the most significant feature of our invention is to suspend with the use of clay the maximum amount of magnesium oxide (as well as calcium oxides or calcium carbonates and/or sulfur as elemental sulfur or ammonium sulfate) in our direct feeding supplement suspension. Inasmuch as the maximum permissible daily uptake by the individual ruminant of the feed supplement is determined to a great extent by the toxicity level of the nonprotein nitrogen therein (i.e., that supplied by the ammonia utilized in ammoniating said phosphoric acid), it is of utmost importance that such amounts of supplement carry to the ruminant at least the minimum daily requirement of Mg.

T904,005
DIAZOTYPE COMPOSITION AND ELEMENT
James C. Fleming, Rochester, N.Y. 14617
Filed Nov. 3, 1971, Ser. No. 195,467
Int. Cl. G03c *1/58*
U.S. Cl. 96—91 R
No Drawing. 22 Pages Specification

Diazotype compositions including a light-sensitive diazonium salt and a coupler compound that can react with the diazonium salt to form an azo dye, wherein the coupler is a 3-hydroxy-2-naphthanilide having the formula



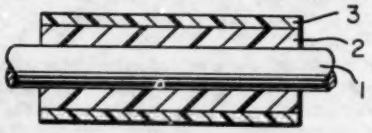
wherein R represents an aryl radical having a formula that is either



wherein R^1 represents a cyanomethyl group, a cyano group, a nitro group or an alkylsulfonyl group; R^2 represents a trihalomethyl group, a halogen atom or a nitro group; R^3 represents a halogen atom and each of R^4, R^5, R^6, R^7 and R^8 is the same and is a halogen atom, preferably fluoro, produce azo dyes of increased red light opacity on development. Particularly desirable such couplers include

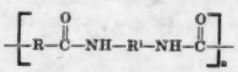
4′-cyanomethyl-3-hydroxy-2-naphthanilide,
4′-chloro-3-hydroxy-3′-trifluoromethyl-2-naphthanilide,
2′,3′,4′,5′,6′-pentafluoro-3-hydroxy-2-naphthanilide,
3′-cyano-3-hydroxy-2-naphthanilide,
3′,4′-dichloro-3-hydroxy-2-naphthanilide,
3-hydroxy-4′-hydroxyethylsulfonyl-2-naphthanilide,
3-hydroxy-3′-nitro-2-naphthanilide,
4′-cyano-3-hydroxy-2-naphthanilide,
4′-chloro-3-hydroxy-3′-nitro-2-naphthanilide, or
3-hydroxy-4′-n-hexadecylsulfonyl-2-naphthanilide.

T904,006
METAL CONDUCTOR HAVING ALTERNATE LAYERS OF AN AROMATIC POLYAMIDE ENAMEL AND AN ACRYLIC WIRE ENAMEL
George P. Mell, Newtown Square, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of abandoned application Ser. No. 883,510, Dec. 9, 1969. This application Nov. 19, 1971, Ser. No. 200,571
Int. Cl. H01b *3/44*; B44d *1/18*
U.S. Cl. 117—218
1 Sheet Drawing. 28 Pages Specification

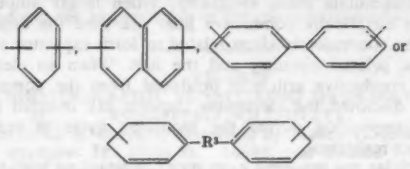


A metal conductor coated with multiple layers of an aromatic polyamide and an acrylic polymer is the subject of this invention wherein

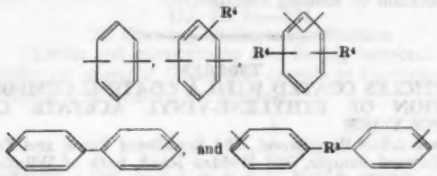
(A) the aromatic polyamide has the following recurring structural unit:



wherein R is either



and R^1 is either



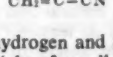
wherein R^3 is either an alkylene radical having 1–3 carbon atoms,

and R^4 is an alkyl group of 1–3 carbon atoms and n is a positive integer sufficiently high to provide a film-forming polymer having an inherent viscosity at 25° C. of at least 0.15 measured at about 0.5% polymer solids in N-methyl pyrrolidone;

(B) the acrylic polymer is

(a) 1–15% by weight of at least one α,β-unsaturated carboxylic acid,

(b) 30–80% by weight of at least one nitrile of the formula



wherein R^6 is either hydrogen and methyl, and

(c) 15–65% by weight of an alkyl acrylate or an alkyl methacrylate having 1–12 carbon atoms in the alkyl groups;

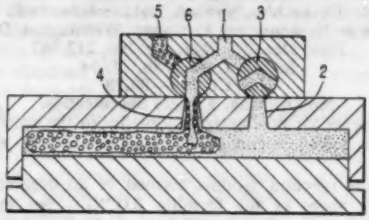
the novel multi-layered metal conductor of this invention has excellent electrical and physical properties, such as a high dielectric strength, a high cut-through temperature, excellent abrasion resistance and flex resistance, and in particular, has a low electrical dissipation factor at elevated temperatures.

T904,007
PRODUCTION OF LAMINAR ARTICLES

Paul Johnson Garner, Thorpe Bay, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 26, 1971, Ser. No. 202,459
Claims priority, application Great Britain, Nov. 30, 1970, 56,695/70
Int. Cl. B29d *27/00*
U.S. Cl. 264—45
2 Sheets Drawing. 31 Pages Specification

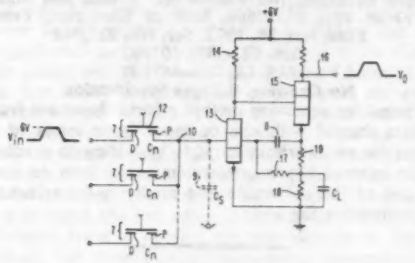
A process in which a skin and core materials are sequentially injected into a mould cavity, wherein skin material is injected through a first sprue channel and core material and also, optionally, skin material, is injected through one or more sprue channels displaced from the first, the amount of skin material injected through the first sprue channel being insufficient to fill the mould cavity and the total amount of skin material injected being in an excess of that required in the final moulding so that subsequent injection of core and/or skin material forces said excess back through a sprue channel through which only skin material was injected. This enables the distribution of skin material relative to core material in the moulding to be modified.



T904,008
CAPACITIVE MATRIX SENSING METHOD AND APPARATUS

William George Crouse, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1971, Ser. No. 203,390
Int. Cl. G08c *1/00*
U.S. Cl. 340—365 C
2 Sheets Drawing. 14 Pages Specification



A low impedance current integrating amplifier is utilized as a sensor for a high impedance capacitive matrix in which changes in capacitance at the cross points of the matrix which depart from a given threshold value are to be sensed.

T904,009
PHOTOGRAPHIC SILVER RECOVERY PROCESS

Paul J. Delmore, 1669 Lake Ave., Rochester, N.Y. 14650

Filed Dec. 27, 1971, Ser. No. 212,690
Int. Cl. C22d *1/12*; C22b *11/00*
U.S. Cl. 204—109
No Drawing. 7 Pages Specification

A photographic silver recovery process involves the production of crude silver containing about 97% silver, 1% lead, 1% copper and 1% of other impurities. To separate the silver, the crude silver is cast in the form of anodes and the silver plated out in an electrolytic cell containing silver nitrate electrolyte. As the plating process proceeds, the concentration of lead nitrate and copper nitrate formed in the electrolyte increases. It is desirable to remove excess lead and copper from the electrolyte. A portion of the electrolyte is first treated with silver oxide. The resulting sludge contains, for example, about 30% silver oxide, 5% each of lead and copper hydroxides (calculated as silver, lead and copper) and varying amounts of silver nitrate solution. In order to avoid an explosion which may result from direct smelting of the sludge, it is first treated with hydrochloric acid or sulfuric acid solution and the resulting silver chloride or silver sulfate sludge is then smelted to obtain silver substantially free of lead and copper.

T904,010

REGENERATIVE VANADIUM COORDINATION CATALYST PROCESS

Tsuneichi Takeshita, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 27, 1971, Ser. No. 212,762
Int. Cl. C08f *1/56, 15/04*
U.S. Cl. 260—80.78
No Drawing. 9 Pages Specification

A process for polymerizing α-olefins in the presence of a regenerative coordination catalyst which is a mixture of:

A. The reaction product formed of an organic halogenating agent of the formula $R(CX_3)_n$ per mole of V_2O_5, R being aryl, haloaryl, haloalkyl, alkaryl, or haloalkaryl; X being halogen; and *n* being 1–3; and

B. An organoaluminum compound.

The process and catalysts are effective for polymerizing homopolymers and copolymers of α-olefins including copolymers of EPDM elastomers.

Polymerization can be carried out with conventional methods as bulk, solution, and slurry polymerization techniques.

T904,011

PROCESS FOR REMOVING METHYL p-FORMYLBENZOATE FROM MIXTURES AND NOVEL ANILS OBTAINED THEREFROM

Edward U. Elam, 702 Yadkin St. 37662, and Max A. Weaver, Rte. 8 37664, both of Kingsport, Tenn.

Filed Jan. 28, 1972, Ser. No. 221,760
Int. Cl. C07c *101/42*
U.S. Cl. 260—471 R
No Drawing. 9 Pages Specification

Process for removing methyl p-formylbenzoate from a mixture thereof with one or more other esters of aryl carboxylic or dicarboxylic acids by adding to a solution of the mixture a primary arylamine to form an insoluble anil of the arylamine and methyl p-formylbenzoate and recovering the anil.

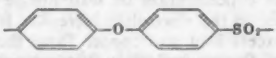
T904,012

AROMATIC POLYMERS CONTAINING A CONDUCTIVE FILLER

Philip Anthony Staniland, Welwyn Garden City, and Michael Whale, Aylesbury, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 1, 1972, Ser. No. 222,700
Claims priority, application Great Britain, Feb. 1, 1971, 3,605/71
Int. Cl. H01b *1/06*
U.S. Cl. 252—503
No Drawing. 12 Pages Specification

Electrically conductive compositions comprising aromatic polymers containing the repeating units —Ar—Q—; Ar being a bivalent aromatic residue and Q being —CO— or —SO_2—, provided that Ar and Q may vary from unit to unit in the polymer chain, at least some of the Ar units having an aromatic ether group in the polymer chain ortho or para to at least one Q group; and up to 50 weight percent of carbon black as a conducting filler are disclosed. Preferred are the thermoplastic polysulphones such as those having repeating units of the formula:



The composition optionally contains a quantity of metal powder, such as aluminium, silver, copper or the like for more even distribution of heat in the resulting article. The compositions disclosed are susceptible to known fabrication methods as applied to other thermoplastic materials including extrusion, casting, blow-moulding, injecting and calendering.

The electrically conductive properties of the resulting articles are used to advantage in heating elements, conductors and resistors among other applications. Even a small amount of the electrically conducting filler, of the order of 0.1 weight percent, results in an article that does not accumulate static electricity. When larger amounts of the electrically conductive filler are used the articles may be conveniently electroplated to form capacitor electrodes, printed circuitry and the like. When an electrically conductive article is produced from the compositions disclosed the electrodes therefor are inserted into the composition during the moulding cycle to reduce contact resistance.

Articles are rendered even more resistant to high temperatures by cross-linking during or after fabrication by irradiation or ionising radiation.

T904,013

ARTICLES COATED WITH A COATING COMPOSITION OF ETHYLENE-VINYL ACETATE COPOLYMER

Bruce Allan Beardwood, 104 Broadbent Road, and Paul Edward Sample, 308 Walden Road, both of Wilmington, Del. 19803; and Bert Sorelle Gorton, 400 N. Union St., Kennett Square, Pa. 19348

Continuation of application Ser. No. 35,572, May 7, 1970, and a continuation-in-part of application Ser. No. 695,853, Jan. 5, 1968, both now abandoned. This application Feb. 25, 1972, Ser. No. 229,511
Int. Cl. C09j *7/02*
U.S. Cl. 117—76 A
No Drawing. 18 Pages Specification

An article of manufacture of a moisture-resistant and heat-sealable, self-supporting film structure comprising a base film of organic polymeric material, such as polyethylene terephthalate, polypropylene, or cellophane, having firmly adhered to at least one surface thereof a coating coated from an aqueous dispersion comprising, based upon the total coating weight, between about 60 and about 70 parts by weight of an ethylene/vinyl acetate copolymer having an ethylene content of 70% to 85% by weight, based upon the copolymer weight, between about 20 and about 25 parts by weight of a wax, such as paraffin, microcrystalline, natural and synthetic waxes, having a melting point of at least 60° C.; between about 5 and about 15 parts by weight of a dispersing agent of sodium-ammonium rosinates having at least 75% ammonium rosinate content; between about 0.5 and about 5 parts by weight of ammonium proteinate; between about 1 and about 10 parts by weight of a polymerized rosin ester, such as the glyceryl esters of polymerized wood rosin acid and hydrogenated wood rosin; and between about 0.5 and about 5 parts by weight of a stearate salt of a metal selected from Group II of the Periodic Table and having an atomic number between 12 and 30, such as calcium, magnesium and zinc, said aqueous dispersion having a pH between about 9 and about 12. The dispersion may also contain between 0.1 and 10 parts of a particulate, e.g., mica, bentonite, steatite talc, and vinyl chloride polymers, having a particle size between 0.5 and 10 microns. The base film may also bear a vinylidene chloride polymer beneath the coating.

T904,014

LEACHING/HEATING PROCESS FOR POTASSIUM TETRATITANATE FIBERS

David P. Fields, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1972, Ser. No. 234,879
Int. Cl. C01g *23/00*
U.S. Cl. 423—598
1 Sheet Drawing. 2 Pages Specification

Fibrous potassium titanate is acid leached to a

$$K_2O/TiO_2$$

molar ratio of 1/8 and the resultant product, the predominate crystal structure of which is potassium octatitanate,

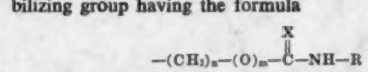
is then heated to a temperature of 400° C. to 700° C. to remove water. Fibers so obtained are especially useful as a reinforcement material for plastics. Acid leaching reduces the susceptibility of the fibers to moisture pick-up.

T904,015
PHOTOGRAPHIC SENSITIZING DYES HAVING IMPROVED SOLUBILITY

Leslie G. S. Brooker, deceased, by Nancy G. Broderson, executor, 183 Main St. 14604, and Donald W. Heseltine, Kodak Park 14650, both of Rochester, N.Y.

Filed Mar. 30, 1972, Ser. No. 239,776
Int. Cl. G03c *1/12*
U.S. Cl. 96—131
No Drawing. 29 Pages Specification

Cyanine and merocyanine dyes having improved solubility are provided. These dyes contain at least one solubilizing group having the formula



wherein *n* is 0, 1 or 2; *m* is 0 or 1; X is oxygen or sulfur, and R is a carboxyalkyl group which typically has 2 to 5 carbon atoms and includes 1 or 2 carboxyl moieties. Light sensitive silver halide emulsions containing such dyes are also provided. The feature dye-solubilizing group can be attached to the heterocyclic nuclei of the dyes, such as to a heterocyclic nitrogen atom, or to the methine chain linking the heterocyclic nuclei.

T904,016
LAMINAR ARTICLE WITH FUSED INTERFACE

William Bauer, Jr., 2046 Winthrop Road, Huntingdon Valley, Pa. 19006, and Newman M. Bortnick, 509 Oreland Mill Road, Oreland, Pa. 19075

Filed Apr. 17, 1972, Ser. No. 244,846
Int. Cl. A47g *5/02*
U.S. Cl. 161—254
No Drawing. 8 Pages Specification

One or two non-tacky film(s) or sheet(s) of the same or different composition formed of a polymer of one or more monoethylenically unsaturated monomers, such as of homopolymers or copolymers of vinyl chloride, butyl methacrylate, or other acrylic acid ester or methacrylic acid ester, e.g. a multistage polymer of U.S. patent 3,562,235 (especially the butyl acrylate, 1,3-butylene glycol diacrylate, methyl methacrylate, methacrylic acid copolymer of Ex. 1 therein) is or are continuously fed to the nip between two moving stainless steel belts, on one or both sides of a monomer/polymer sirup also being fed into the nip for polymerization thereof during travel of the film(s) and sirup between the belts, such as in equipment disclosed in U.S. Patent 3,376,371, to form a two-ply or three-ply laminate.

The sirup may be composed of a solution of polymethyl methacrylate, or of a copolymer of at least 50% methyl methacrylate with at least another monomer, such as styrene, acrylonitrile, vinyl acetate, or a (C_1–C_8)alkyl ester of acrylic acid or of methacrylic acid, in methyl methacrylate or in a mixture thereof with at least another of the monomers mentioned.

T904,017
RADIOGRAPHIC ELEMENTS CONTAINING ANTIHALATION DYES

Allan G. Millikan, 5417 E. Hawthorne St., Tucson, Ariz. 85711, and Edward J. Seus, Kodak Park Works, Rochester, N.Y. 14650

Filed Apr. 21, 1972, Ser. No. 246,246
Int. Cl. G03c *1/84, 1/92, 1/02*
U.S. Cl. 96—84
No Drawing. 44 Pages Specification

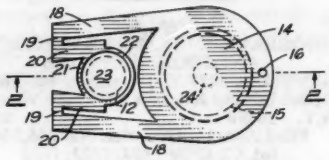
Radiographic elements are comprised of a support on which there is coated a surface latent image silver halide emulsion layer and a fogged internal latent image silver halide emulsion layer and contain a dye in the fogged emulsion layer which is adsorbed to the silver halide grains and which functions to control halation. Typical dyes which are useful for this purpose are cyanine, complex cyanine, merocyanine and hemioxonol dyes. In processing of the element, the dye is removed together with the silver halide grains to which it is adsorbed. Elements in which the surface image emulsion layer is spectrally sensitized in the region of 600 to 650 nanometers, and in which the dye which is incorporated in the fogged emulsion layer to control halation absorbs in this same region, are especially advantageous. Incorporation of two different dyes in the fogged emulsion layer, such as a combination of anhydro-3,9-diethyl-5,5'-dimethoxy-3'-(3-sulfopropyl)thiacarbocyanine hydroxide and anhydro-3',9-diethyl-5'-methoxy - 5 - phenyl-3-(3-sulfobutyl)oxaselenacarbocyanine hydroxide, is particularly useful.

PATENTS

GRANTED NOVEMBER 7, 1972

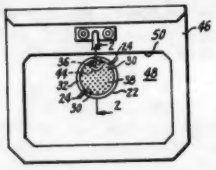
GENERAL AND MECHANICAL

3,702,012
TOILET TANK FLUSH VALVES
Samuel M. Bennett, 362 Central Avenue, Brighton, Colo.
Filed July 23, 1971, Ser. No. 165,041
Int. Cl. E03d 1/34
U.S. Cl. 4—57 P **4 Claims**



A flat sheet of flexible material of uniform thickness provided adjacent its forward extremity with an opening adapted to fit about the overflow pipe of a conventional toilet tank and provided adjacent its rear extremity with a circular disc adapted to fold down upon the flush valve fitting of the tank. An open-bottomed float bulb is formed on the lower surface of the disc so as to enter and close the fitting to retain water in the tank. When the disc is lifted, the bulb will buoyantly arise in the tank to open the fitting to flush the tank.

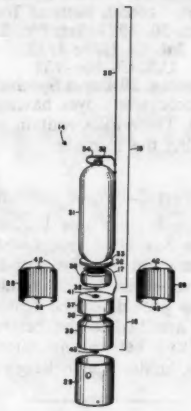
3,702,013
HAIR CATCHING DEVICE
Meril D. Gebert, 101 Expando Street, Vallejo, Calif.
Filed Dec. 9, 1970, Ser. No. 96,337
Int. Cl. E03c 1/20, 1/26
U.S. Cl. 4—288 **1 Claim**



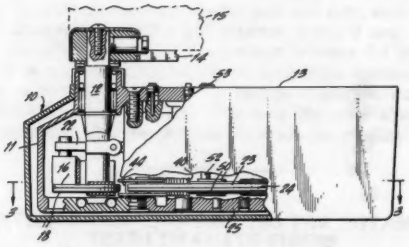
A convex screen extending upward from a circular housing which has an opening therein extending into a downward tube along one portion thereof.

3,702,014
SQUIB EJECTED MARKER BUOY
James L. Rabon; Warren H. Biegler, and Raymond E. Kelly, all of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy
Filed Feb. 19, 1971, Ser. No. 116,779
Int. Cl. B63b 21/52
U.S. Cl. 9—8 R **9 Claims**

The invention disclosed is an improved buoy and storage-launching arrangement therefor. The buoy has a buoyant body portion with a spring extension protruding upwardly from the upper portion thereof. A spool containing a suitable length of lightweight line, which may be unwound axially therefrom, is secured to the lower portion of the body portion. Clip means secure the spring extension to the side of the device and secure the body to an anchor, which has an explosive actuation squib thereon, in such a manner as to form a compact cylindrical arrangement which may be explosively expelled from a cylindrical storage compartment.

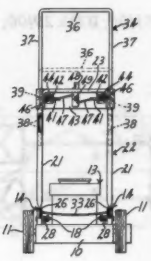


3,702,015
HOLD OPEN ASSEMBLY FOR CHECKING FLOOR HINGE
Conrad C. Blom, Landrum, S.C., assignor to Bommer Spring Hinge Co., Inc., Landrum, S.C.
Filed Oct. 13, 1971, Ser. No. 188,828
Int. Cl. E05f 3/20, 3/22
U.S. Cl. 16—55 **6 Claims**



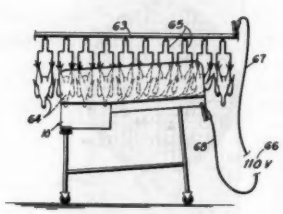
A hold open assembly for a checking floor hinge is disclosed in which a cam having a step in the cam face is yieldably engaged by a spring loaded cam follower roller. In the non-hold open position substantially all of the loading is removed from the cam follower. A simplified mechanism is provided to change the assembly from the non-hold open to the hold open condition.

3,702,016
HANDLE UNIT FOR LAWN MOWER
Ernest W. Keesee, 3767 South Court Street, Montgomery, Ala.
Filed March 24, 1971, Ser. No. 127,522
Int. Cl. A47b *95/02*
U.S. Cl. 16—111 **10 Claims**



A lower handle member having depending legs pivotally connected to upstanding brackets on mower housing with stop members at opposite sides of legs. Springs urge legs toward brackets and release member moves legs away from brackets permitting angular movement of legs. Upper handle member having depending legs is adjustably connected to legs of lower handle member and retained at selected positions by releasable means.

3,702,017
POULTRY STUNNING APPARATUS
Ernest E. Lewis, Flowery Branch, Ga., assignor to Gainsville Machine Company, Inc., Gainsville, Ga.
Filed Dec. 17, 1970, Ser. No. 98,993
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **13 Claims**

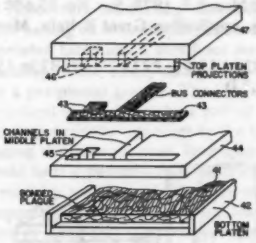


Method and apparatus for stunning poultry as they are moved along a predetermined path in a poultry processing operation. The stunning apparatus includes an upwardly open reservoir means detailed for containing a predetermined amount of liquid. An upwardly inclined ramp means is connected to one edge of the reservoir means. The inclined ramp means includes an upper surface detailed in flow communication with the reservoir means. The stunning apparatus includes shield means extending upwardly from opposite sides of the reservoir means and the inclined ramp means to define an upwardly open channel therebetween. A supply conduit including automatic valve control means is provided for maintaining liquid in the reservoir means at a predetermined level. The reservoir means includes pump means for delivering liquid under pressure to sprayer means which are supported along opposite sides of the reservoir means and adjacent the inclined ramp means. The reservoir and the inclined ramp means are supported at a predetermined location above a supporting surface by support means. Electrical insulator means are provided between the support means and the reservoir and inclined ramp means. The stunning apparatus is supported at a predetermined location relative to a poultry conveying apparatus whereby poultry conveyed by the conveying apparatus will pass through the stunning apparatus. One terminal of an electric current circuit is connected to the conveying apparatus and the other terminal of the electric current circuit is connected to the poultry stunning apparatus whereby poultry passing therethrough will be stunned due to the completion of the electric circuit between the conveying apparatus and the stunning apparatus through the poultry by the spraying of the electrical conducting liquid contained in the reservoir means onto the poultry as they are conveyed along the predetermined path.

3,702,018
HANGER ARRANGEMENT
Philip C. Wood, 1101 New Hampshire Avenue, Apt. 521, Washington, D.C.
Filed Dec. 9, 1970, Ser. No. 96,494
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 B **6 Claims**

An S-shaped hanger with a tongue adapted to fit on a standard four-wheel supermarket basket to hold a folding two-wheel shopping cart for carriage with the supermarket basket.

3,702,019
METHOD OF MAKING DIFFUSION BONDED BATTERY PLAQUES
William Pollack, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed April 13, 1971, Ser. No. 133,549
Int. Cl. B23p *13/00*
U.S. Cl. 29—2 **6 Claims**



A flexible, expansible, porous, metal fiber electrode plaque is made by (1) dispersing metal fibers in a viscous liquid (2) removing the viscous liquid by vacuum filtration to provide a metal fiber felt of contacting fibers (3) metallurgically bonding the contact points of the fibers in the felt together to provide bonded annealed fibrous plaques and bus connectors (4) coining the annealed plaque to provide a plaque having a body portion of between 70 and 97 percent porosity and a bus connector portion of up to 70 percent porosity, by pressing the bus connectors into contact with predetermined areas of the plaque and then (5) metallurgically bonding the contact points of the plaque and bus connectors together.

3,702,020

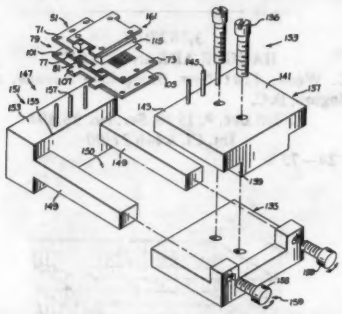
ELECTRODE ALIGNMENT AND ASSEMBLING DEVICE

Donald L. Say, Seneca Falls, N.Y., assignor to GTE Sylvania Incorporated

Continuation-in-part of Ser. No. 860,625, Sept. 24, 1969, abandoned. This application May 5, 1971, Ser. No. 140,526

Int. Cl. H01j *9/06, 9/10, 9/46*

U.S. Cl. 29—25.19 **9 Claims**



A device for assembling and aligning the electrode planes of a multibeam electron gun structure for an electron discharge device, such as a high resolution cathode ray tube which utilizes a defined array of collimated electron beams provided by the multibeam single gun structure. The device facilitates aligning a planar arrangement of separate control electrode members, forming an aperture array, with at least one accelerating-collimating electrode plane having a similar array of apertures. The accelerating-collimating electrode so oriented in spaced and substantially parallel relationship with the control grid plane provides a collimated array of beams directed to impinge the cathodoluminescent screen in a defined pattern array.

3,702,021

METHODS OF MAKING HEAT EXCHANGERS

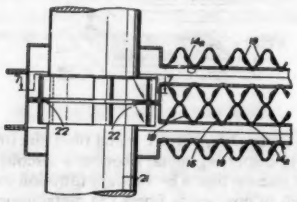
John Anthony Bartlam Wolfe, and John Edwin Frederick Clark, both of London, England, assignors to Chrysler United Kingdom Limited, London, England

Filed March 2, 1970, Ser. No. 15,600

Claims priority, application Great Britain, March 4, 1969, 11,568/69

Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*

U.S. Cl. 29—157.3 D **5 Claims**



A method of making a heat exchanger of the kind consisting of a stack of sheet metal pressings in face to face relation, adjacent pairs of pressings providing between them alternately channels for flow of coolant and spaces for flow of air, in which method the pressings are joined together by cold welding operations.

3,702,022

METHODS OF MAKING HEAT EXCHANGERS

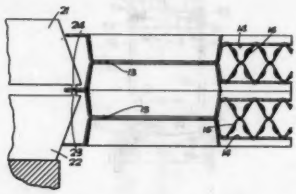
Anthony John Duke, Stoke, and Horace John Dagley, Rugby, both of England, assignors to Chrysler United Kingdom Limited, London, England

Filed March 16, 1970, Ser. No. 19,777

Claims priority, application Great Britain, March 20, 1969, 14,744/69

Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*

U.S. Cl. 29—157.3 D **6 Claims**



A method of making a heat exchanger of the kind comprising a stack of sheet metal pressings in face to face relation, adjacent pairs of pressings providing between them alternately channels for flow of coolant and spaces for the flow of air, the method consisting of cold welding the pressings together.

3,702,023

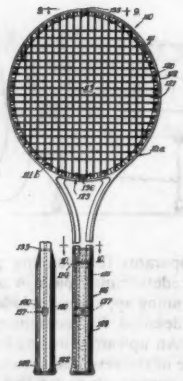
METHOD OF FORMING A RACQUET

Samuel H. Melnick; Samuel W. Landsman, both of Chicago, and Walter A. Stromski, Des Plaines, all of Ill., assignors to Midland Sporting Goods Company, Inc., Chicago, Ill.

Division of Ser. No. 738,634, June 20, 1968, Pat. No. 3,582,073. This application March 22, 1971, Ser. No. 126,851

Int. Cl. B23p *15/16, 19/04*

U.S. Cl. 29—163.5 **11 Claims**



A method of forming a game-playing strung racquet construction wherein the frame is cast of metal. The frame may be formed of a high tensile strength alloy, such as an aluminum alloy.

3,702,024

METHOD OF LINING METALLIC WALLED CARRIERS

Charles P. Baker, Jr., Hinsdale, Ill., assignor to Omark Industries, Incorporated, Portland, Oreg.

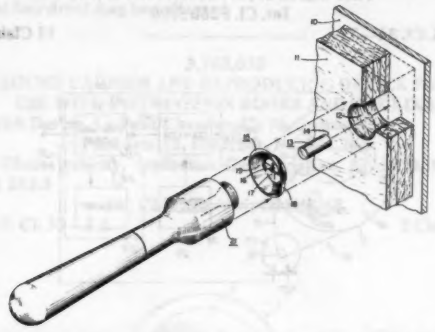
Division of Ser. No. 723,502, April 23, 1968, abandoned. This application Nov. 10, 1969, Ser. No. 875,599

Int. Cl. B23q *17/00*

U.S. Cl. 29—407 **1 Claim**

Method and apparatus for securing liners to metallic walled cargo carriers including an end weldable stud adapted to pass

through an aperture in the liner and to be end welded to the metallic wall of the cargo carrier by means of an electric stud end welding technique together with a spring retainer including a thin flange on one end larger than the aperature in the



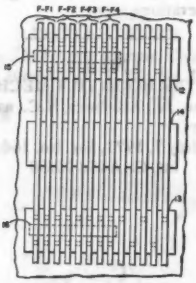
wall panel and spring fingers projecting inwardly and away from the flange and into the aperature of the panel to permit the retainer to fit flush with the outer surface of the wall panel and to grip the stud to secure the wall panel in engagement with the metallic wall of the cargo carrier.

3,702,025

DISCRETIONARY INTERCONNECTION PROCESS

Alva I. Archer, Clearwater, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 12, 1969, Ser. No. 823,741
Int. Cl. B01j *17/00*
U.S. Cl. 29—574 **1 Claim**



A process wherein numerous identical or similar cells are formed into a continuous chain of such cells on a single semiconductor wafer is shown. The cells are cataloged as either good or bad cells and then a layer of dielectric followed by a pattern of conductors is deposited over all of the cells. Connections are discretionarily made to the good cells by omitting to etch holes through the dielectric layer over the contacts of bad cells and by shorting across all cells and then removing the shorts across the good cells.

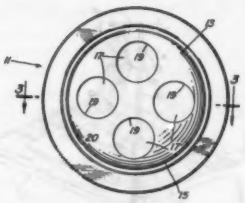
3,702,026

RAZOR

Harold W. Scholin, Park Ridge, Ill., assignor to Unirazor, Ltd., Northbrook, Ill.

Continuation of Ser. No. 652,744, July 12, 1967, abandoned, which is a continuation of Ser. No. 452,787, May 3, 1965, abandoned. This application Oct. 18, 1971, Ser. No. 190,274
Int. Cl. B26b *21/42, 21/54*
U.S. Cl. 30—49 **9 Claims**

A razor comprising a circular, spherically curved blade formed with circular, edge sharpened shaving openings equally spaced circularly about the center of the blade, the sharpened edges of the openings being formed at the outer convex surface of the blade, by the intersection of said outer surface with spherical surfaces ground in the inner concave surfaces of the blade, at and outwardly of the edges of the



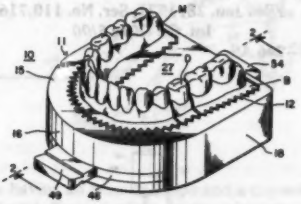
holes, so that, by gyrating the convex surface of the blade in contact with a skin surface to be shaved, hair will be sliced off, at the skin surface, by the sharpened peripheral edges of the holes, a ring-like handle being fastened to the blade, at its periphery, to aid in manipulating the same in the performance of the shaving operation.

3,702,027

DIE HOLDER FOR DENTAL LABORATORY

Edwin L. Marshall, White Plains; Harvey Bocian, Jericho, and Neil L. Hauptman, Jamaica, all of N.Y., assignors to So-Mar Dental Studios, Inc., Jamaica, N.Y.

Filed March 8, 1971, Ser. No. 121,822
Int. Cl. A61c *13/00*
U.S. Cl. 32—11 **11 Claims**



A dental restoration fabricating assembly includes a rigid body member having an arch shaped, open-topped cavity with vertically serrated faces and a thin liner member mating and separably nesting in the cavity and provided along its lower border with a peripheral groove. The line is prevented from vertical movement in the cavity by a pair of locking members slideable through opposite openings in the body member and tightly engaging the liner grooves. In employing the assembly the cavity held liner is partially filled with a plastic solidifiable mass and a model is positioned in the mass or the model is cast from the impression and allowed to harden with the mass in the liner. One or more dies may be separated by removing the unlocked liner and dental cast from the cavity, slicing the desired dies and the bonded sections of the liner from the remains of the cast, working the dies as desired, reassembling them in the cavity in their initial positions and then locking them in place by reinsertion of the locking member.

3,702,028

DENTAL IMPLANT EXTRACTING TOOL

Alfred E. Edelman, 2723 Federal Street, Camden, N.J.

Filed Nov. 7, 1972, Ser. No. 72,606
Int. Cl. A61c *3/10*
U.S. Cl. 32—61 **11 Claims**

A tool for extracting dental implants of the type having a wide blade, a narrow neck and an enlarged head. The tool in-

cludes a shank having a lateral extension at one end thereof formed with a slot to receive the neck of an implant. A retainer is adjustably positioned on the shank to prevent disengagement of the implant neck from the slot. The other end of

the shank is provided with an elongated handle having a weight slidable thereon against a stop, so that impacts may be delivered through the handle and shank to extract the implant from a patient's jaw.

3,702,029

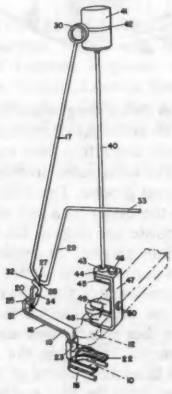
VISUAL AID FOR TRAILER HITCH

Harold D. Anderson, Jr., Oakesdale, Wash.

Filed Jan. 28, 1971, Ser. No. 110,716

Int. Cl. G01c *5/00*

U.S. Cl. 33—246 AS **6 Claims**



An automotive accessory to assist a driver to accurately back a towing vehicle to align the vehicle-mounted hitch component with the trailer-mounted hitch component when the hitch cannot be seen by the driver wherein an upright rod having a ring-like indicator rotates to indicate fore and aft alignment and a comparison of the relative positions of the vehicle mounted indicator and a trailer-mounted indicator reveals the lateral alignments. The trailer mounted indicator is adjustably mounted to compensate for longitudinal angularity of the vehicle and trailer.

3,702,030

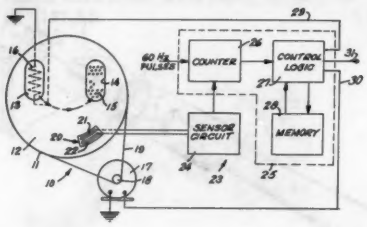
DIGITAL DRYER CONTROL CIRCUIT

Donald E. Janke, Benton Harbor, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed March 29, 1971, Ser. No. 129,008

Int. Cl. F26b *3/00*

U.S. Cl. 34—33 **11 Claims**



A fabric treating apparatus, such as a domestic clothes dryer, is provided with a digital control circuit and a sensor system which cooperate to terminate a fabric treatment operation when the fabric has reached a desired condition. A digital counter receives and accumulates pulses from a reference source and is repetitively reset by signals from a sensor circuit which provides reset pulses at a rate dependent upon the dryness condition of the fabric load. As the fabric load approaches the desired dryness condition the interval between reset pulses increases, thus allowing the counter to accumulate successively greater counts before being reset, until eventually a preselected count is accumulated which triggers circuitry to terminate the fabric drying operation. After termination of the drying operation the counter serves as a clock and operates in conjunction with an indexable digital memory and associated logic circuitry to control a program of subsequent fabric treatment operations.

3,702,031

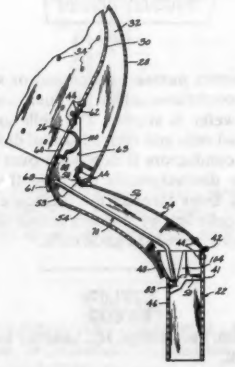
HAIR DRYER HOOD TILT MECHANISM

William D. Ryckman, Jr., Asheboro, N.C., assignor to General Electric Company

Filed July 7, 1971, Ser. No. 160,375

Int. Cl. A45d *20/00*

U.S. Cl. 34—99 **9 Claims**



A hair dryer that may be collapsed for carrying and erecting for operation, including a base assembly, a rigid tiltable hood assembly to be positioned about the head of the user for distributing heated air to the head and a strut hinged at both ends to the hair dryer between the hood assembly and base assembly one end of the strut being connected to the hood as-

sembly. A push-rod member pivotally movable about two points and maintained under compression force cooperates with the hinged strut to apply supporting force to the hood assembly when the hair dryer is in the erected position. In the carrying position the push-rod is out of compression so that the hair dryer may be collapsed.

3,702,032

SOUND CARRIER AND REPRODUCING DEVICE FOR USE WITH INSTRUCTION BOOKS AND THE LIKE

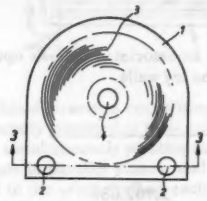
Erich Doring, La-Punt/Chamues-Ch 96, Switzerland

Filed Jan. 13, 1971, Ser. No. 106,201

Claims priority, application Germany, Jan. 13, 1970, P 20 01 283.3

Int. Cl. G09b *1/06*; G11b *3/68*

U.S. Cl. 35—8 A **2 Claims**



A sound carrier is affixed where desired by the user onto a printed page of a book or the like and a sound reproducing unit is operatively engaged with the sound carrier by the user through the medium of visually locatable positioning means cooperatively carried by the sound carrier and the reproducing unit.

3,702,033

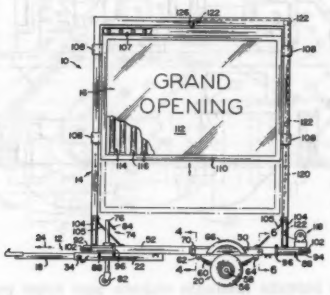
DISPLAY DEVICE

Kelly R. Coleman, 2367 Anna Avenue, Clearwater, Fla.

Filed June 23, 1971, Ser. No. 155,770

Int. Cl. G09f *7/00*

U.S. Cl. 40—129 R **18 Claims**



A portable display device having a base comprising running gear which includes a plurality of wheels and a pulling tongue wherein the wheels may be detachably secured to the base such that the base may be permanently affixed to a given location. A sign is reciprocally mounted on the base by means of a supporting frame such that the sign may be raised or lowered to any desired position through the operation of a lifting mechanism in the form of a power or manually operated winch connected to the sign by a pulley and cable arrangement. Lights may be arranged on both the interior and exterior of the sign and operated by a power supply, in the form of a battery or generator which also may be carried on the base of the sign.

3,702,034

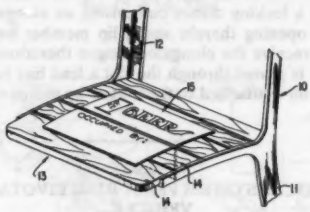
SEAT MARKER

Irving W. Pfeiffer, Springlake, Mich., assignor to Seat Marker, Incorporated, Palatine, Ill.

Filed Sept. 4, 1970, Ser. No. 69,603

Int. Cl. G09f *23/06*

U.S. Cl. 40—320 **8 Claims**



A seat marker made from a sheet of material and folded in a generally V-shaped configuration with flaps for maintaining the same in a substantially flush relationship with a surface of the seat to indicate the occupancy of the same.

3,702,035

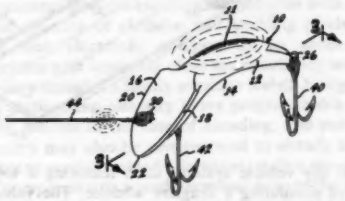
FISH LURE

Melkiah E. Pope, Valencia, Calif., assignor to Pope Manufacturing, Inc.

Filed June 4, 1970, Ser. No. 43,414

Int. Cl. A01k *85/00*

U.S. Cl. 43—42.35 **4 Claims**



A fish lure having an arcuate shape and a curved triangular shaped head with flanged edges on the triangular head. The head tapers sharply so that the interaction of the fish lure with water causes a narrow rapid tail action plus sideways erratic darting, so as to be very imitative of a fish.

3,702,036

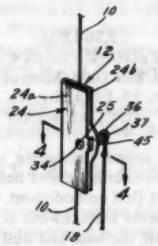
ADJUSTABLE LEAD LINE CONNECTOR

John McNeill, 210 South Catalina, Apt. 10, Pasadena, Calif.

Filed July 22, 1971, Ser. No. 164,990

Int. Cl. A01k *91/04*

U.S. Cl. 43—44.85 **5 Claims**



An adjustable lead line connector device whereby lead lines having fish hooks attached thereto can be positioned along the

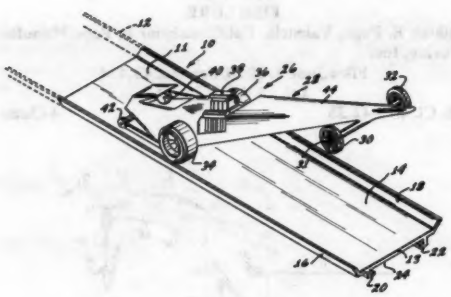
lower portion of a fishing line, the connector comprising a flat flexible member which is provided on one inner face thereof with a protruding nipple oppositely disposed from a matching cup-like securing ring. The ring has an inner diameter corresponding to the diameter of the nipple so that when the flexible member is bent and folded along its center the nipple is received within the ring, securing the connector device to the fishing line. The outer edges of the flexible member are provided with a locking means comprising an elongated tongue having an opening therein and a lip member having a slot therein to receive the elongated tongue therethrough. When the tongue is passed through the slot a lead line having a fish hook thereon is attached to the tongue by means of the opening therein.

3,702,037

TOY VEHICLE SYSTEM FEATURING PIVOTABLE TOY VEHICLE

Raymond M. Toy; John C. Parker, both of Los Angeles, and Brian S. Prodger, Torrance, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Feb. 22, 1971, Ser. No. 117,269
Int. Cl. A63h *11/10*
U.S. Cl. 46—201 **9 Claims**



Several toy vehicle systems each featuring a toy vehicle capable of simulating a dragster wheelie. The vehicle has a forward portion and a two part rearward portion with one part being fixed to the forward portion and the other part being pivotally connected relative the forward portion. When the two parts are engaged, the moment of force of the rearward portion is greater than that of the forward portion, relative a pivot axis, causing the forward portion to assume an upwardly slanted position. When the two parts are not engaged, the forward portion is in a generally horizontal position. Launching mechanisms are provided for constraining the vehicle in a horizontal position even through the the two parts are engaged. Once the vehicle separates from the launching mechanism, the vehicle will do a wheelie. Connectors are also provided which bias the vehicle between its two positions.

3,702,038

TOYS WITH SOUND PRODUCING MEANS

Louise Z. Hakim, P.O. Box 1026, Monroe, La.

Filed Oct. 29, 1971, Ser. No. 193,756
Int. Cl. A63h *5/00*
U.S. Cl. 46—175 **5 Claims**

Toys incorporate sound producing components in such manner that the components cannot become dislodged from the toy structure. In a first embodiment, the sound producing component is a separate element but is embedded in a boss formed on the toy wall, the boss and wall including interfitting means which engage the component to securely anchor it in place. The material of fabrication of the toy fully envelopes the sound producing component.

In the second embodiment, the sound producing component is formed integrally with the toy and has a conical

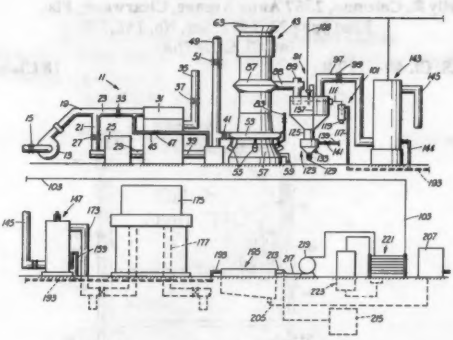
sound chamber with an associated bellows operated responsive to squeezing of the toy walls.

3,702,039

PRODUCTION OF USABLE PRODUCTS FROM WASTE MATERIAL

Kenneth W. Stookey, Markle, Ind., and Anil K. Chatterjee, Tonawanda, N.Y., assignors to Torrax Systems, Inc., North Tonawanda, N.Y.

Filed Aug. 31, 1970, Ser. No. 68,085
Int. Cl. C10j *3/00*
U.S. Cl. 48—111 **14 Claims**



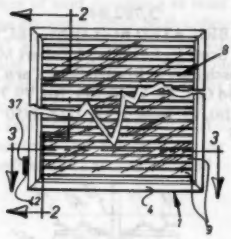
In an apparatus and method of treating waste materials for recovering valuable materials including a fuel gas and liquid hydrocarbons, the waste materials are charged to the upper end of a vertical gasification chamber and preheated air blast is introduced into the hearth thereof. A producer gas is generated within the gasifier at such a temperature that metal, glass and other noncombustibles are reduced to a molten condition. As waste materials move downwardly under gravity, the hot producer gas moves upwardly pyrolyzing an organic portion of the waste materials. The gases evolved in the gasifier are passed from the upper end thereof and contacted with a cooling liquor comprising water. Thus, entrained particulate and a condensable portion including liquid hydrocarbons are separated from the evolved gases into a liquid phase whereby a fuel gas is produced.

3,702,040

VENETIAN BLIND STRUCTURE, MORE PARTICULARLY FOR DOUBLED GLAZED SEALED WINDOW UNIT

Fernand Roy, 405 Vanier Street, Ville Brossard, Quebec, Canada

Filed June 22, 1971, Ser. No. 155,487
Claims priority, application Canada, July 2, 1970, 087134
Int. Cl. E06b 7/08
U.S. Cl. 49—64 10 Claims



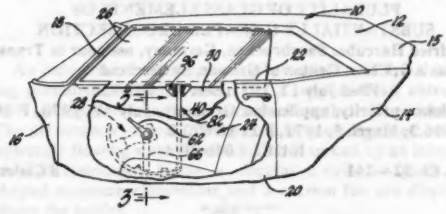
A venetian blind structure comprising a plurality of elongated slats pivotally mounted at their ends in a support frame and means for simultaneously pivoting said slats and for maintaining said slats in parallel planes, said means comprising a wheel secured to the pivot shaft of each slat, pins protruding from said wheel and extending through an opening in a reciprocable actuating member, each opening formed with rack teeth along one edge for engaging said pins, the pins adapted to abut transverse edges of said opening to limit the angular position of said slats, and a mechanism for moving said reciprocable member in two directions. The blind structure is more particularly adapted to be mounted within the air space of a double glazed sealed window unit.

3,702,041

WINDOW REGULATOR

Edward G. Podolan, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 13, 1971, Ser. No. 179,803
Int. Cl. E05f 11/38
U.S. Cl. 49—348 3 Claims



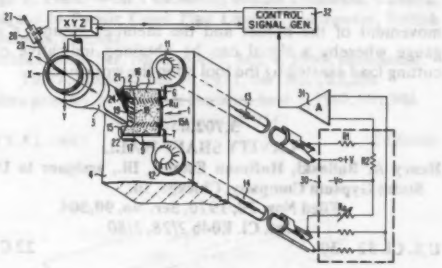
A rotary input type window regulator adapted to move a vehicle mounted window between open and closed positions with a single stroke of an operating handle, the window regulator including an operating handle supported on the body and pivotable through an angular range of less than 180°, a lift arm connected to the handle for unitary pivotal movement therewith, a flexible tape-like drive member connected to the lift arm and to the window, and guide members defining a path of motion for the driver member including a first run extending in a circular arc about the pivot axis of the lift arm and having a radius equal to the length of the lift arm and a second run extending generally parallel to the path of motion traversed by the window. The length of the lift arm is predetermined to effect bodily movement of the drive member sufficient to completely open or close the window in response to pivotal movement of the handle through its angular range.

3,702,042

ABRADING APPARATUS

Thomas J. Cochran, Lagrangeville; Charles P. Coughlin, Chelsea; Walter W. Ficker, Fishkill; Charles V. Lent, Poughquag, and Joseph M. Sullivan, Millbrook, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 25, 1970, Ser. No. 92,818
Int. Cl. B24c 3/04
U.S. Cl. 51—8 20 Claims



This patent discloses apparatus for altering the electrical characteristics of electrical and electronic components by trimming or abrading, the rate of abrading being variable and is responsive to changes in the electrical characteristics of the components during the abrading operation. Electrical components that have electrical characteristics that may be altered by the abrading apparatus include resistors, capacitors, inductors, semiconductive devices, and photocells.

The apparatus includes electrical circuitry for both accurate control of the rate of abrasion and enabling production of electrical and electronic components to predetermined characteristics with unusually close manufacturing tolerances. The circuitry includes a highly sensitive Kelvin bridge at each abrading station, the circuitry being programmable for trim pretesting, control of the rate of abrading, and post-testing. The circuitry may also be programmed to abrade a discrete component to predetermined tolerances, and/or abrade one of a pair of components to a predetermined ratio of the electrical characteristic of one component to the electrical characteristic of the other of the pair. Additionally, the circuitry may be programmed to abrade one component in a connected closed loop of components to predetermined tolerances, for example "in circuit" abrading.

The mechanical arrangement of the apparatus provides for sequentially abrading multiple electrical and electronic components which may be positioned on both the upper and lower surfaces of single insulating members such as ceramic substrates. The apparatus is fully mechanized for rapid processing of a high production product through sequential abrading stations and includes stations for rejecting out-of-tolerance components.

3,702,043

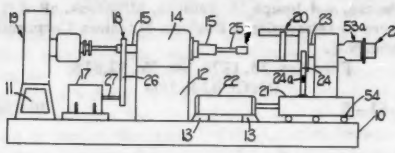
LAPPING, HONING OR THE LIKE MACHINES

Donald Burkewood Welbourn; James Derek Smith, both of Cambridge, and Bruce Robert Ashworth Buckley, Leeds, all of England, assignors to C.A.V. Limited, Birmingham, England

Filed Dec. 10, 1970, Ser. No. 96,954
Claims priority, application Great Britain, Dec. 11, 1969, 60,437/69
Int. Cl. B24b 5/00, 49/00, 5/00
U.S. Cl. 51—92 R 11 Claims

A machine for removing material from an internal surface of a workpiece and comprising a workpiece holder which is reciprocably mounted upon a support structure, a tool supporting member in the form of a spindle, the tool supporting member being driven by a motor means and the tool being

mounted upon the spindle and connected to an actuator whereby the effective size of the tool can be adjusted. The workpiece holder includes a member which restrains angular



movement of the holder and the member mounts a strain gauge whereby a signal can be obtained indicative of the cutting load exerted by the tool upon the workpiece.

3,702,044

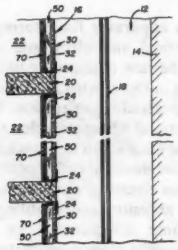
CAVITY SHAFT WALL

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Nov. 18, 1970, Ser. No. 90,504

Int. Cl. E04b *2/28, 2/80*

U.S. Cl. 52—30 **22 Claims**



A cavity shaft wall capable of withstanding pressure loading, comprising two spaced rows of wall members spaced by studs having means for engaging three vertical sides of each edge of the members comprising the row exposed to the shaft. The means preferably are provided by side flanges which open out into the stud, the flanges being bent to form pockets and being free to expand as the exposed members shrink, as in a fire. Insulating wool and electrical utilities can be accommodated in the air gap formed by the spaced rows.

3,702,045

ARRANGEMENT IN OR RELATING TO A TERRACE FLOOR AND A METHOD FOR THE PRODUCTION OF SAME

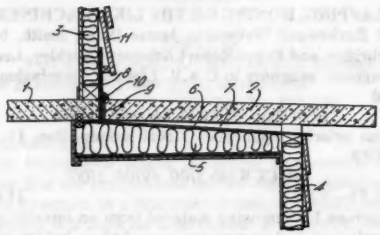
Olav Selvaag, Holmenveien 19, Oslo, Norway

Filed Jan. 18, 1971, Ser. No. 107,360

Claims priority, application Norway, Jan. 26, 1970, 281/70; Dec. 1, 1970, 4611/70

Int. Cl. E04d *1/36, 3/38*

U.S. Cl. 52—58 **10 Claims**



An arrangement of a terrace floor in front of a set back story of a building, which floor is provided with a layer of thermal insulation underneath. A waterproof layer is arranged between the thermal insulation and the terrace floor has an air space in communication with the atmosphere outside the building at least on its top surface and possibly below its base. The terrace floor is separated from the floor inside by a gap. A waterproof sheet or the like is placed in the gap, running from the waterproof layer, over the insulating material below the terrace floor, upwards through the gap and up inside the facing of the exterior wall above.

3,702,046

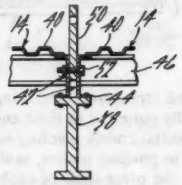
PREFABRICATED BUILDING SECTIONS

James C. Lewis; Scott C. Lewis, and Robert M. Hockett, all of Tulsa, Okla., assignors to Braden Steel Corp., Tulsa, Okla.

Filed Oct. 12, 1970, Ser. No. 79,734

Int. Cl. E04c *2/32, 2/38, 2/50*

U.S. Cl. 52—125 **8 Claims**



A prefabricated building section is disclosed having a corrugated panel with ridges and grooves and a side support channel affixed adjacent a side boundary of the panel and spaced from the nearest ridge thereof to accommodate a corresponding support channel of a like section stacked thereon prior to erection of the building. Additionally, the support channel extends from the panel a sufficient distance to provide clearance for the ridges of a corrugated panel stacked thereagainst to prevent damage thereto. The building sections may also be provided with a lifting lug which is mounted to the support channel for pivotal movement between a projecting position in which it may be engaged by a lifting device and a nonprojecting position in which it serves as a spacer to provide a construction clearance between adjacent sections upon assembly.

3,702,047

GLASS WALL CONSTRUCTION CONSISTING OF A PLURALITY OF GLASS ELEMENTS OF SUBSTANTIALLY U-SHAPED CROSS-SECTION

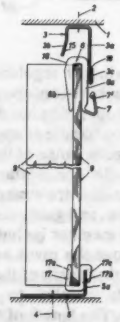
Siegfried Harcuba, Saarbrucken, Germany, assignor to Transglas AG, Chur, Canton of Grisons, Switzerland

Filed July 12, 1971, Ser. No. 161,723

Claims priority, application Germany, July 17, 1970, P 20 35 606.3; March 5, 1971, P 21 10 673.0

Int. Cl. E04b *2/74*

U.S. Cl. 52—241 **8 Claims**



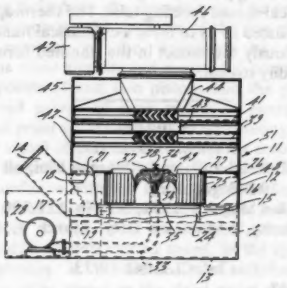
A glass wall construction composed of a plurality of glass elements, each possessing a substantially U-shaped cross-sec-

tional configuration, and intended to be secured within a mounting which can be fixed into the opening of a structure, such as a building wall. This mounting embodies at least an upper rail member and a lower rail member. The leg portions of the glass elements are adhesively bonded in abutting relationship with respect to one another such that the sheet-like webs of all of the glass elements forming the glass wall are disposed in a given plane, which is preferably vertically oriented. Attachment elements, in the form of sliders, serve for resiliently guiding the glass elements with respect to the upper rail member of said mounting at least at the upper region of such glass elements. Each of the sliders is formed as a resilient element which is displaceable with respect to the glass elements and leg members of the mounting. These displaceable slider elements have at least a pair of depending leg portions, and projection means provided at one of said leg portions of each said slider element for partially encompassing a leg of the mounting, and wherein the leg portions of said mounting are configured or accommodated to the shape of the slider elements.

ERRATUM

For Class 52—690 see:
Patent No. 3,702,050

3,702,048
AIR WASHER
Stanley O. Howick, 8120 Barnsbury, Union Lake, Mich.
Filed March 10, 1971, Ser. No. 122,932
Int. Cl. B01d *50/00*
U.S. Cl. 55—238 **3 Claims**

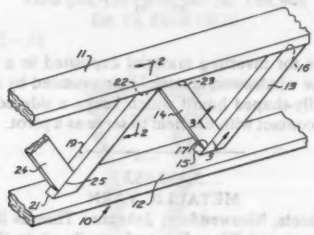


An industrial air washer having a vertical cylindrical housing partially filled with water and a tangential air entrance with an adjustable baffle plate controlling the inlet resistance. The air enters V-shaped baffles circularly arranged around an upwardly flowing water stream which is spread by an inverted conical distributor below a circular distributor plate. V-shaped moisture eliminators and a suction fan are disposed above the baffles.

3,702,049
DEVICE FOR CLEANING POLLUTED AIR
Ewel J. Morris, Jr., 901 West Walnut Street, Sylacauga, Ala.
Filed Sept. 24, 1970, Ser. No. 75,048
Int. Cl. B01d *46/40*
U.S. Cl. 55—278 **1 Claim**

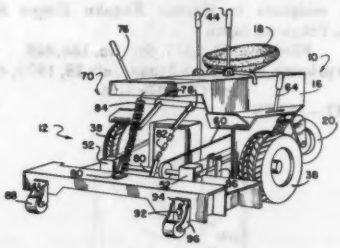
Device for cleaning polluted air wherein decontaminant granules anchored in adjacent surfaces of sheets extending alongside and spaced from each other. Deformations in adjacent surfaces receive adjacent portions of granules and retain outer portions of granules in air passageway between adjacent surfaces.

3,702,050
WOOD TRUSS ARRANGEMENT
George E. Price, West Vancouver, British Columbia, Canada, assignor to Pacific Coast Pipe Limited, Vancouver, British Columbia, Canada
Continuation of Ser. No. 830,450, Jan. 4, 1969, abandoned.
This application Jan. 4, 1971, Ser. No. 103,884
Claims priority, application Canada, June 1, 1967, 991,946
Int. Cl. E04c *3/02, 3/42*
U.S. Cl. 52—693 **2 Claims**



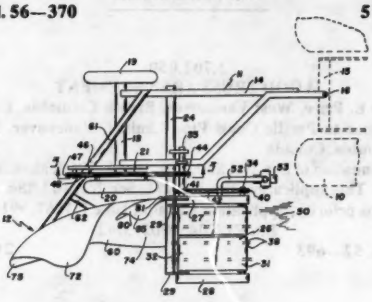
A wood truss, or lattice girder, arrangement with finger scarfing of only alternate generally parallel members to the chords, with oppositely inclined generally parallel web members only to the inclined webs. Material reduction of web to chord to web transference achieved producing a stronger truss with webs of the same size.

3,702,051
INDEPENDENTLY OPERABLE DUAL DRIVE WHEEL RIDING POWER MOWER
John Deines, P. O. Box 207, Ransom, Kans.
Filed Sept. 8, 1970, Ser. No. 70,227
Int. Cl. A01d *35/26*
U.S. Cl. 56—11.3 **3 Claims**



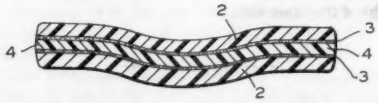
A riding power mower having a front mounted rotary power mower assembly thereon and further comprising a frame, a motor mounted on the frame, a pair of forward drive wheels each independently driven from the motor through separate transmissions, and a single, trailing support wheel, freely pivotally mounted on a vertical axis.

3,702,052
SWATH TURNER
John P. Klassen, 45593 Yale Road West, Chilliwack, British Columbia, Canada
Filed July 9, 1971, Ser. No. 161,861
Int. Cl. A01d 79/00
U.S. Cl. 56—370 5 Claims



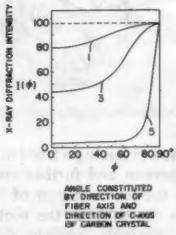
Apparatus for inverting material deposited in a field as a windrow, the windrowed material being rotated by a substantially helically-shaped board which keeps a side edge of the windrow in contact with the field to serve as a pivot.

3,702,053
METALLIC YARN
Peter J. Schoots, Nieuwendam; Johannes Thomas Brugmans, Wormerveer, and Klaas Hoogenhout, Brock in Waterland, all of Netherlands, assignors to Lurex, N.V., Amsterdam, Netherlands
Filed Dec. 18, 1969, Ser. No. 886,247
Int. Cl. D02g 3/36, 3/40, 3/12
U.S. Cl. 57—154 5 Claims



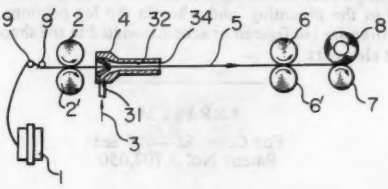
A laminated yarn adapted for tone-on-tone or cross dyeing with dispersed dyestuffs comprising metallized transparent films laminated with an adhesive comprising a copolymer of a major portion of polyethylene and a minor portion of a comonomer.

3,702,054
PRODUCTION OF GRAPHITE FIBERS
Tadashi Aruki; Kiro Asano, and Jun Yamada, all of Tokyo, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan
Filed July 27, 1971, Ser. No. 166,448
Claims priority, application Japan, July 28, 1970, 45/65556
Int. Cl. D02g 3/16
U.S. Cl. 57—157 TS 3 Claims



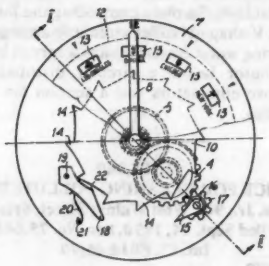
Graphite fibers having superior strength and modulus of elasticity can be obtained by twisting carbon fibers at a specified twisting rate, and then graphitizing the twisted yarn.

3,702,055
METHOD FOR MANUFACTURING FALSE TWISTED THREADS FROM THERMOPLASTIC RESIN TAPES
Kenzo Kosaka; Masami Tsunewaki; Hideo Tanaka, all of Nagoya-shi, and Akira Aoki, Inazawa-shi, all of Japan, assignors to Mitsubishi Rayon Company Limited, Tokyo, Japan
Filed Aug. 4, 1969, Ser. No. 847,132
Claims priority, application Japan, Aug. 14, 1968, 43/57477
Int. Cl. D02g 1/02, 1/16
U.S. Cl. 57—157 TS 25 Claims



A method for manufacturing false twisted thermoplastic thread from thermoplastic resin tape comprises passing the tape through a region wherein an eddy stream of a high temperature high pressure fluid such as steam, superheated steam and air is present. The eddy stream is produced by eccentrically jetting a high pressure fluid of a temperature not lower than the plasticizing point having the thermoplastic resin tape into a cylindrical thread forming tube. The thermoplastic resin tape is false twisted so as to form a cylindrical bundled thread and simultaneously thermoset in the bundled form all by the effect of the eddy stream.

3,702,056
WORLD TIMEPIECE
Armando Zoli; Luigi Zoli, and Giuseppe Fini, all of via della Foscherara, 29 Bologna, Italy
Filed March 5, 1971, Ser. No. 121,290
Claims priority, application Italy, March 9, 1970, 3361 A/70
Int. Cl. G04b 19/33
U.S. Cl. 58—43 1 Claim



A timepiece for showing the time in different time zones which comprises a dial with a plurality of apertures which has under it a disc having the numbers or hours of the different time zones arranged at positions along a circle corresponding to the positions of the said apertures and suitable operating elements to rotate said disc by one step corresponding to 1 hour of the rotation of the minute hand.

3,702,057

PROCESS FOR CONTROL AND REGULATION OF DOUBLE PISTON-DRIVEN ENGINE WITH HYDROSTATIC MOTION TRANSDUCERS

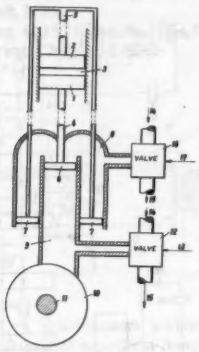
Wolfgang Rabiger, Buckenhofen, Germany, assignor to Grundig E.M.V., Kurgartenstrasse, Germany

Filed Dec. 14, 1970, Ser. No. 97,786

Claims priority, application Germany, Dec. 23, 1969, P 19 64 455.4

Int. Cl. F02b *41/00*

U.S. Cl. 60—19 **26 Claims**



A system for controlling the relative positions of the two pistons in double or opposed piston engines having hydrostatic motion transducers for transmitting the piston energy to a driveshaft. The control is effected by adding fluid to or withdrawing fluid from the transducers. The system includes means for comparing the positions of the two pistons and the angle of rotation of the driveshaft to generate two synchronous error signals, and means for comparing the actual dead points of said two pistons and the predetermined nominal dead points of each piston to generate first and second dead point error signals, and for relating the first dead point error signal to the second dead point error signal. Fluid is added to or withdrawn from the hydrostatic motion transducers in accordance with the synchronous error signals when the engine speed is below a selected engine speed, and in accordance with a dead point error signal when said engine speed exceeds a predetermined speed. In the system, control of both pistons is simultaneously switched from the synchronous error signal to the dead point error signal and vice versa.

3,702,058

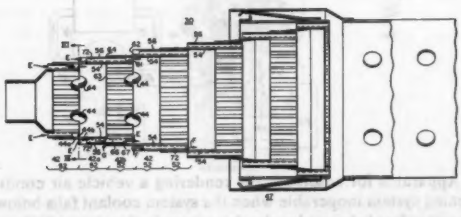
DOUBLE WALL COMBUSTION CHAMBER

Serafino M. De Corso, Media, and Carl W. Carlson, Holmes, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 13, 1971, Ser. No. 106,041

Int. Cl. F02g *3/00*

U.S. Cl. 60—39.65 **20 Claims**



A combustion chamber for a gas turbine power plant of the step-liner type including a plurality of annular double wall step-liner portions. The portions are of various sizes and are arranged concentrically and in order of increasing size from the upstream end toward the downstream end of the chamber. Each double wall liner portion includes an alternating smooth wall member and a serpentinous wall member. In one step, the smooth wall member is the radially inner wall and an overlapping portion of the serpentinous wall member is the radially outer wall. In the adjacent larger step, the serpentinous wall member is the radially inner wall and an overlapping portion of a larger diameter smooth wall member is the radially outer wall. The effect of this construction is to provide a combustion chamber capable of withstanding higher burning temperatures.

3,702,059

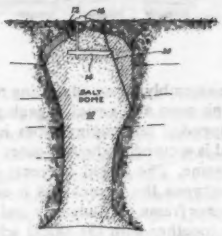
GROUTING FISSURES IN UNDERGROUND ROCK SALT DEPOSITS

Charles H. Jacoby, Dalton, Pa., assignor to International Salt Company, Clarks Summit, Pa.

Filed Oct. 13, 1971, Ser. No. 188,906

Int. Cl. E02d *19/16*

U.S. Cl. 61—35 **6 Claims**



There is disclosed an improved method for grouting (sealing) a ground water conducting fault zone, fissure, or the like, such as has been inadvertently intersected when mining an underground salt deposit.

3,702,060

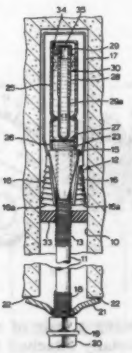
RESIN-BONDED EXPANSION SHELL

James Deans Cumming, Havelock, Ontario, Canada

Filed Feb. 25, 1971, Ser. No. 118,843

Int. Cl. E21d *20/02*

U.S. Cl. 61—45 B **14 Claims**

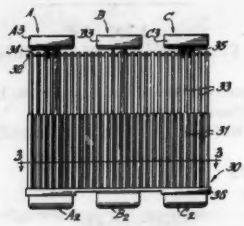


A resin reinforced anchor for a rock bolt consists of an expansion shell of a known type modified to mount a resin container. The resin container carries a resin and a hardener-containing capsule therein in such a way that actuation of the expansion shell breaks the hardener-containing capsule, mixes its contents and the contents of the container, and releases the mixed contents, to adhere the expansion shell to the sides of a drill hole.

3,702,061
HYDRAULIC SUPPORT SYSTEMS FOR MINE WORKINGS

Max Kuhn, Bochum-Langendreer; Gunter Bell, Horneburg, and Willy Watermann, Dortmund-Berghofen, all of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Division of Ser. No. 4,930, Jan. 20, 1970, Pat. No. 3,618,325. This application Sept. 20, 1971, Ser. No. 181,763
Int. Cl. E21d 15/44
U.S. Cl. 61—45 D 3 Claims

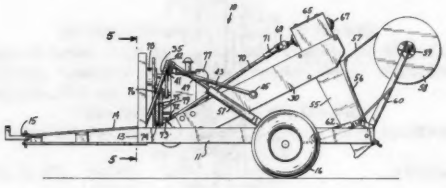


A three frame assembly for an advancing roof support, each frame having a pit prop and a roof engaging cap. A shield in the form of suspended telescoping pipes is common to the three frames and is secured to the two outer frames for movement with the same. The shield prevents packing material from entering between the frames and is contoured for this purpose. The center frame may advance and subsequently the two end frames together with the shield advances. The roof engaging cap for each frame inclines downwardly at an angle generally parallel to the angle of rest of the packing material.

3,702,062
MOBILE VIBRATORY CABLE PLOW

Walter C. Olson, Box 356, Baudette, Minn.

Filed Sept. 9, 1970, Ser. No. 70,814
Int. Cl. E02f 5/02; A01b 3/64, 35/00
U.S. Cl. 61—72.6 6 Claims

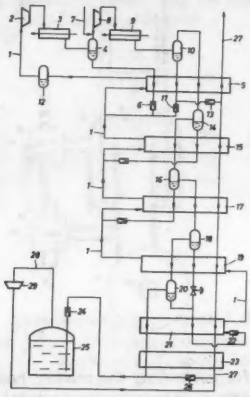


A mobile trailer having a pair of rearwardly extending, spaced apart arms pivotally attached thereto with an elongated plow blade affixed therebetween in a downwardly extending position. An eccentric-type vibrator is also mounted between the arms for rotation about an axis parallel with the arms to vibrate the plow blade in a direction transverse to the direction of movement of the trailer and blade. The trailer further has means for mounting a spool of conduit and a channel is formed along the trailing edge of the plow blade for positioning the conduit at the bottom of a trench formed by the plow blade.

3,702,063
REFRIGERATION CYCLE FOR THE ALIQUEFACTION OF NATURAL GAS

Volker Etzbach, Munich, and Wolfgang Forg, Grunwald, both of Germany, assignors to Linde Aktiengesellschaft, Hollriegelskreuth, Germany

Filed Nov. 4, 1969, Ser. No. 873,964
Claims priority, application Germany, Nov. 4, 1968, P 18 06 879.6
Int. Cl. F25j 1/00, 5/00, 1/02
U.S. Cl. 62—23 17 Claims

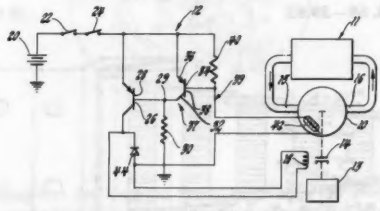


In the liquefaction of natural gas wherein the refrigeration cycle fluid contains natural gas components, and such components are subjected to fractional condensation to obtain different temperature levels of refrigeration, the system is improved by adjusting the C_3–C_6 content of cycle fluid and the pressure of at least one intermediate pressure stage of the circulation pressure in such a manner that condensate is formed in the corresponding intercooler of said pressure stage. This condensate is then separated and subjected to heat exchange to utilize its refrigeration values and recirculated to the circulation compressor via an expansion valve. In this way, a substantial concentration of heavy hydrocarbons can be utilized to increase the refrigeration capacity of the refrigeration cycle, but said hydrocarbons do not deleteriously affect the lower temperature levels of refrigeration.

3,702,064
AIR CONDITIONING PUMP SHUTOFF

Henry J. Ciolli, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 5, 1071, Ser. No. 169,299
Int. Cl. F25b 27/00
U.S. Cl. 62—158 3 Claims



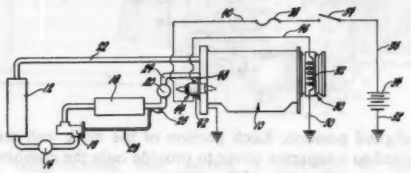
Apparatus for automatically rendering a vehicle air conditioning system inoperable when the system coolant falls below a certain level. An avalanche thermistor in the air conditioner pump is immersed in the coolant as long as the coolant is above the certain level. When the coolant falls below the cer-

tain level it no longer cools the thermistor, which then changes from a high resistance to a low resistance. The decrease in thermistor resistance causes deenergization of a clutch coil that must be energized for the pump to be operable. In alternative embodiments the clutch coil is also prevented from being energized when the vehicle engine is inoperative.

3,702,065
AUTOMOBILE AIR CONDITIONING COMPRESSOR SUPERHEAT SAFETY AND AMBIENT SWITCH

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 6, 1971, Ser. No. 169,775
Int. Cl. F25b *27/00*
U.S. Cl. 62—158 **2 Claims**

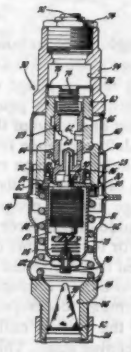


In preferred form, a combination ambient temperature sensing switch and refrigerant superheat temperature responsive switch for an automobile air conditioning system having an electromagnetic clutch for transmitting engine rotation to a refrigerant compressor. The ambient temperature sensing portion of the switch is connected between the automobile battery and the coil of the clutch for energizing the coil whenever ambient temperatures are above a predetermined level. The refrigerant temperature responsive portion of the switch is connected between the battery and a fuse in short-circuit relation to the clutch coil to cause the fuse to blow in response to a predetermined maximum refrigerant temperature which closes the switch. A thermistor in circuit with the refrigerant temperature responsive switch delays the short circuiting of the clutch coil to prevent immediate blowing the the fuse.

3,702,066
AUTOMATIC EXPANSION VALVE, IN LINE, PILOTED

Paul K. Beatenbough, Medina, and Carl A. Scherer, Clarence Center, both of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed July 22, 1971, Ser. No. 165,194
Int. Cl. F25b *41/04*
U.S. Cl. 62—222 **3 Claims**

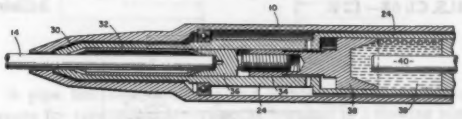


Refrigerating apparatus for an automotive air conditioning system including a pressure responsive expansion valve between the condenser and the evaporator. Movement of a piston valve which is reciprocal within a valve housing controls the flow of refrigerant into the evaporator. Evaporator inlet pressure acts against one end of the piston and a control pressure established by a pilot valve and passage from the condenser outlet acts against an opposite end of the piston to regulate the pressure in the evaporator. An expandable bellows enclosure within a control pressure enclosure moves to open and close the pilot valve passage which produces a relatively constant control pressure.

3,702,067
FORCE TRANSMISSION AND APPARATUS

James M. Stewart, West Palm Beach, Fla., assignor to Stewart Research, Inc., West Palm Beach, Fla.

Filed Nov. 4, 1969, Ser. No. 873,976
Int. Cl. F16d *3/00*
U.S. Cl. 64—27 **2 Claims**

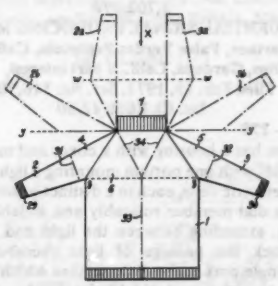


The disclosure hereinafter set forth relates to force transmission in any environment. As an essential element in the working force system a substantially noncompressible, nonfluid, but readily deformable gel is employed. In such force transmission, the gel is deformed within a confining but variable zone, and the resulting thrust is translated to force receiving means. The disclosure has wide application and the specific illustration relates to dental and/or surgical type power operated handpieces.

3,702,068
KNITTING METHOD

Max William Betts, Coventry, and Frank Robinson, Borrowash, both of England, assignors to Courtland Limited, London, England

Continuation-in-part of Ser. No. 842,506, July 17, 1969, abandoned. This application June 18, 1971, Ser. No. 154,673
Claims priority, application Great Britain, July 22, 1968, 34,853/68
Int. Cl. A41b *9/06*
U.S. Cl. 66—176 **10 Claims**



A method of knitting a sleeved garment on a knitting machine, the method including the steps of knitting a first fabric portion constituted by shoulder portions of the sleeves in reciprocatory manner on both beds of a pair of opposed beds of a knitting machine such that pieces of each shoulder portion on the two beds are joined together at the edge of the sleeve which is innermost on the machine, and knitting a second fabric portion constituted by front and rear upper body portions of the garment as flat fabric on the pair of op-

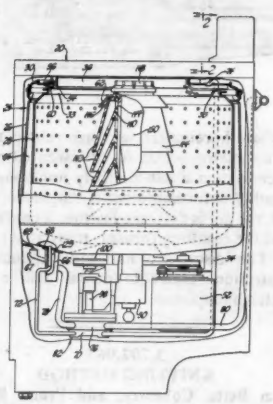
posed beds, making needles progressively inactive in an inwards direction from both ends of the needle beds during knitting of one of said first and second fabric portions and bringing the inactive needles progressively back into action in the opposite direction during knitting of the other fabric portion whereby the first and second fabric portions are shaped and joined to one another, the remaining sleeve and body portions being knitted as tubular fabrics integral with said shoulder portions of said sleeves and said upper body portions of the garment respectively.

3,702,069

APPARATUS FOR SANITIZING A DOMESTIC CLOTHES WASHER

Verlos G. Sharpe, Northfield, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1971, Ser. No. 158,681
Int. Cl. D06f *39/02, 39/08*
U.S. Cl. 68—12 R **3 Claims**



A method and apparatus for sanitizing domestic clothes washer wherein a predetermined concentration of liquid sanitizing solution is first distributed throughout the washer and the washer's water recirculation system, then removed from the washer but retained in the water recirculation system.

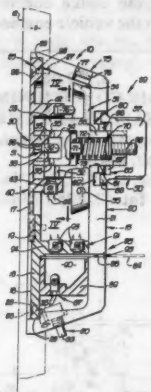
3,702,070

SEQUENTIAL SIGNAL PRODUCING MEANS

Klaus W. Gartner, Palos Verdes Peninsula, Calif., assignor to Peter Phillips, Gardena, Calif., a part interest

Filed Feb. 19, 1971, Ser. No. 116,909
Int. Cl. E05b *47/00*
U.S. Cl. 70—278 **20 Claims**

The means has a housing with a cover and mating two portion back wall, with one portion mounting a light and a plurality of photo-electric cells, each in a distinct position around the light, with a dial member rotatably and slidably mounted to the housing, extending between the light and photo-electric cells to block the passage of light therebetween except through a single port in the dial member which is rotatable to each distinct portion and slidable into and out of alignment with the light and a respective cell to product a sequential signal, and with the other portion mounting a light centrally located in a reflector member to direct the light rays to each of a plurality of photo-electric cells, with a patterned card being insertable between the reflector member and cells to pass light, only to preselected cells to produce the sequential signal, with such signal from either portion being sent to a means discriminately receiving a sequential signal. Mating ratchet teeth may be provided on the housing and dial member to insure the positioning of the port in a distinct position, to prevent rotation in the aligned position, and to cam the dial to the non-aligned position upon attempted rotation in



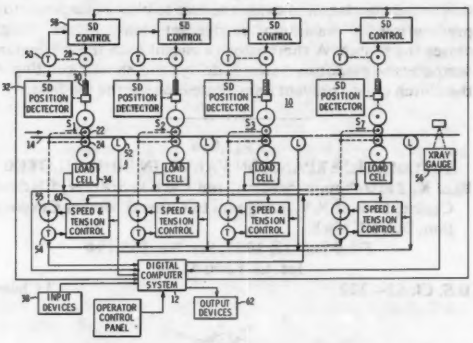
the aligned position. Each portion of the back wall may be mounted to a separate cover to provide only the combination portion or card portion of the means.

3,702,071

GAUGE CONTROL METHOD AND APPARATUS FOR METAL ROLLING MILLS

Edward J. Masar, Irwin, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 14, 1970, Ser. No. 80,683
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **14 Claims**



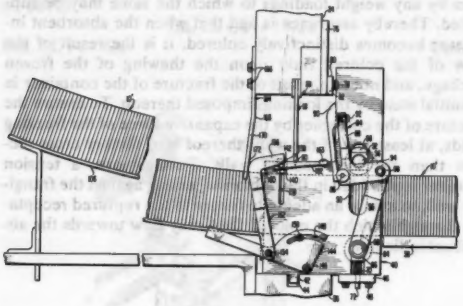
A programmed digital computer control system provides an on-line roll force gauge control for a multiple stand tandem hot metal strip rolling mill, A gauge control program calculates the workpiece strip delivery gauge or thickness related force error from at least one stand of the rolling mill and compares this calculated delivery gauge related force error with a desired or reference delivery gauge related limit force error for the same stand to establish a delivery gauge error related force error. The gauge control program then determines in relation to the magnitude of this force error representation of the delivery gauge error for the same one stand that this force error is to be corrected by adjustment of the operation of that same one stand or is to be fed forward in the direction of the workpiece strip movement to determine the correction in a succeeding stand of the rolling mill by adjustment of the operation of the succeeding stand. This force error is effective to adjust the latter stand operation for a time interval related to the movement of the workpiece or workpiece strip portion where this force error is measured between those respective stands of the rolling mill.

3,702,072

APPARATUS FOR CONTOURING A HONEYCOMB CORE

John E. Broderick, Orchard Beach, Md., assignor to Martin Marietta Corporation, New York, N.Y.

Filed May 18, 1970, Ser. No. 38,460
Int. Cl. B21d *11/00*
U.S. Cl. 72—307 14 Claims



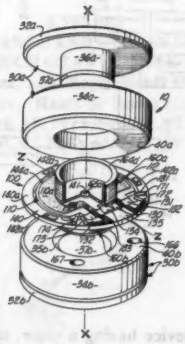
A reciprocating ram carries a plurality of spaced, downwardly projecting prongs which enter a transversely aligned row of honeycomb core cells, deforming the cells from one end to cause the honeycomb core to curve in concave fashion toward the prongs. The honeycomb core billet is released when the prongs are fully inserted to allow self-realignment prior to incrementing the billet to bring the next alternate row of cells into prong receiving position. Pawl and ratchet feed means and a releasable hold down bar operate cyclicly to facilitate production of the curvature.

3,702,073

ACCELEROMETER

Earl D. Jacobs, Tustin, Calif., assignor to Sundstrand Data Control, Inc.

Filed Feb. 28, 1969, Ser. No. 803,208
Int. Cl. G01p *15/08*
U.S. Cl. 73—517 8 Claims



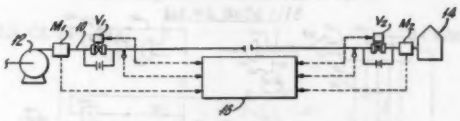
An accelerometer is provided for detecting acceleration which employs a flapper ring clamped at raised points between upper and lower portions of a magnet structure. The flapper is suspended by a bifilar hinge on the ring between two permanent magnets. Coils are mounted on opposite sides of the flapper, each encircling one of the permanent magnets and separated therefrom by an air gap. Each side of the flapper has a metallic coating thereby forming a capacitor with an inner face of the magnet structure on each side of the flapper. As the accelerometer is accelerated, the flapper is displaced relative to the magnet structure thus increasing the capacitance of one capacitor and decreasing the capacitance of the other capacitor. Electrical signals proportional to the change in the capacitances, and therefore proportional to the acceleration, are fed through a servo loop to the coil which set up a magnetic field which interacts with the magnetic fields of the permanent magnets to oppose the displacement of the flapper.

3,702,074

PIPE LINE LEAK DETECTION AND LOCATION SYSTEM

John S. Mullen, Florham Park, N.J., assignor to Esso Research and Engineering Company

Filed Aug. 19, 1971, Ser. No. 173,113
Int. Cl. G01m *3/02, 3/28*
U.S. Cl. 73—40.5 R 7 Claims



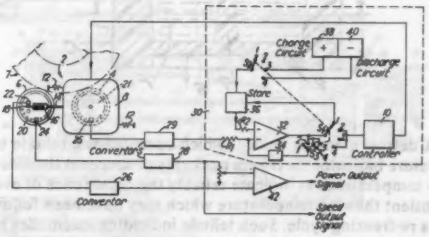
A pipe line leak detection and location system including means for raising and lowering the pressure in a flowing pipe line, and metering the flow at the inlet and outlet of the pipe line at the different pressure levels, thus enabling pipe line leaks of very small magnitude to be detected. By determining the increase in the rate of a leak at high pressure over that obtained at low pressure, pipe line leaks can be detected. Block valves paralleled by orifices, or control valves, located at spaced intervals along the pipe line permit the raising and lowering of the pressure in selected segments of the pipe line, and allow the particular location of the leak also to be determined. When a leak is present the different between the inflow and outflow readings will be greater at the higher pressure than at the lower pressure and when there is no leak present, the difference between these readings well be the same at the high pressure and the low pressure. Electronic control means are provided to receive pressure and flow responsive signals from the pipe line and transmit these signals to further control equipment connected with the pipe line for controlling pressure and flow thereof.

3,702,075

VEHICLE TESTING APPARATUS

John Anthony Marten, Holt, and Bernard Arthur Gene, Marham, both of England, assignors to Suntester Limited, Norfolk, England

Filed March 29, 1971, Ser. No. 128,994
Claims priority, application Great Britain, March 31, 1970, 15,224/70
Int. Cl. G01l *5/13*
U.S. Cl. 73—117 4 Claims



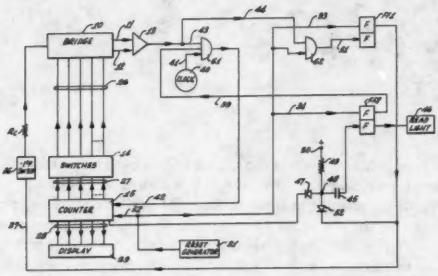
The disclosure describes a chassis dynamometer in combination with control means comprising an amplifier, respective inputs of which are fed to a speed signal dependent on the speed of rotation of the rollers of the dynamometer and to a reference signal. The output of the amplifier is selectively fed

either to means controlling the braking torque of the dynamometer, the arrangement being such that a negative feed back loop is completed, or alternatively to the input of a store, from the output of which the reference signal is derived, so as to maintain the reference signal at a value corresponding to the speed of rotation of the rollers.

3,702,076
ELECTRONIC THERMOMETER

Heinz W. Georgi, La Jolla, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed June 15, 1970, Ser. No. 45,990
Int. Cl. G01k 7/24
U.S. Cl. 73—362 AR **34 Claims**

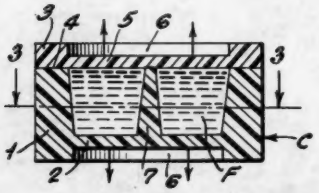


Electronic apparatus for measuring temperatures by means of a thermistor in one arm of a Wheatstone bridge, bridge balance being accomplished by a plurality of shunt resistances selectively inserted into the balancing arm of the bridge by counter controlled switching, the counter state being altered by gated clock pulses to provide a digital indication of measured temperature. Anticipation circuitry is provided for correlating the time between counter clock pulses with the time vs. temperature characteristic of the thermistor to selectively alter bridge balance and counter state so as to provide an earlier indication of the anticipated temperature at which the thermistor will finally stabilize.

3,702,077
DEFROST EVINCING DEVICES

Bela G. Szabo, 5138 Delford St., Pittsburgh, Pa.

Filed Aug. 19, 1970, Ser. No. 64,986
Int. Cl. G01k 11/08
U.S. Cl. 73—358 **16 Claims**

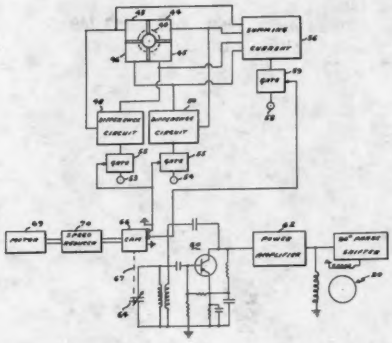


A defrost evincing device, which operates as a telltale temperature indicator for frozen packages or spaces maintained at low temperatures to indicate reliably the occurrence of even a transient thawing temperature which may have been followed by a re-freezing cycle. Such telltale indicating assemblies have been included for this purpose in frozen food packages and the like, and these generally comprise a capsule filled with a colored liquid such as colored water, which capsule ruptures upon the initial freezing of the package, leaving free the frozen coloring fluid for eventual flow upon the thawing of the frozen package. When this occurs, the flowing liquid may permeate an absorbent piece of paper or the like disposed in proximity to the capsule, which imparts distinctive color to the absorbent indicator, which is permanent and irreversible, to constitute evidence of the package having gone through at least one thawing cycle even if it was re-frozen subsequently. The instant invention aims to provide a rugged container for the colored fluid capable of sustaining heavy loads so that the same is fractured only upon freezing of the container rather than by any weight loadings to which the same may be subjected. Thereby assurance is had that when the absorbent indicator becomes distinctively colored, it is the result of the flow of the colored fluid upon the thawing of the frozen package, and not as a result of the fracture of the container in its initial state by the loadings imposed thereon. To ensure the fracture of the container by the expansive force of the freezing fluids, at least one of the walls thereof is of thinner cross-section than the load-bearing walls. Furthermore, a tension member is provided in the container, acting against the frangible wall, to assure an adequate fissure in the ruptured receptacle through which the colored fluid may flow towards the absorbent indicator.

3,702,078
DYNAMICALLY STABILIZED ACCELEROMETER AND RATE GYRO DEVICE

George E. Knausenberger, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 22, 1971, Ser. No. 201,079
Int. Cl. G01p 9/00; G01c 19/28
U.S. Cl. 73—504 **4 Claims**



A gyroscopic device having a rotor, supported in a liquid within a chamber, with the speed of the chamber being changed cyclically by varying the speed of a synchronous motor. The speed of the synchronous motor is changed by varying the output frequency of an oscillator which drives the motor through a power amplifier. Rate gyro information and acceleration information by means of a photoelectric pickup device with the change of position of the illumination spot being used to provide a pair of rate signals in a pair of difference circuits. A change in spot size is used to provide an acceleration signal in the output of a summing circuit. Gates in the output of the difference circuits and summing circuits are operated by the same cam that controls motor speed to close the gates during different portions of the speed change cycle.

3,702,079
APPARATUS FOR THE FORMATION OF OUTPUT SIGNALS FROM GYROSCOPES

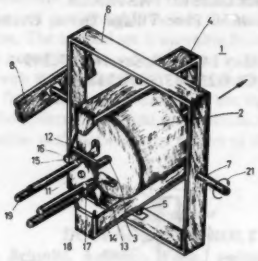
Walter Kranz, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm Gesellschaft mit beschrankter Haftung, Ottobrunn near Munich, Germany

Filed Sept. 16, 1970, Ser. No. 72,639

Claims priority, application Germany, Oct. 10, 1969, P 19 51 087.3

Int. Cl. G01c *19/28*

U.S. Cl. 74—5.6 **9 Claims**



A gyroscope is supported in three gimbals pivotal about mutually perpendicular axes which are perpendicular to an axis of rotation of the gyroscope rotor. The gyroscope rotor is rotatably mounted in a rotor frame constituting the inner gimbal, and the outer gimbal is secured to the fuselage of an airborne vehicle. A planar diaphragm is secured to the rotor frame. Four jet nozzles discharge fluid streams into respective collector nozzles axially aligned therewith, the four jet nozzles being arranged at the corners of a square which is standing on one corner. The planar diaphragm normally interrupts the flow of air from the jet nozzles to the collector nozzles. Each pair of collector nozzles is connected to respective control inputs of a flow amplifier which inputs are also connected to the output channels of a flow oscillator providing sawtooth output pulses. The amplifier provides pulse-width modulated output signals corresponding to deflections of the fuselage about a pitch axis, a yaw axis, or both.

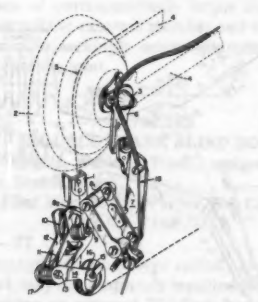
3,702,080
CYCLE GEAR CHANGE AND CYCLES EQUIPPED WITH SUCH GEAR CHANGE

Jacques Andre Huret, and Roger Henri Huret, both of 60, Avenue Felix Faure, (Hauts de Seine) Nanterre, France

Filed Feb. 19, 1971, Ser. No. 117,009

Int. Cl. F16h *11/04, 7/10*

U.S. Cl. 74—217 B **3 Claims**



A cycle gear change enabling the cycle drive chain to pass from one free wheel pinion to another, these pinions having a relatively large difference in the number of teeth in order to obtain a large speed variation for the moving cycle, this gear change being fitted with a roller which may be displaced cross-wise to a cycle free wheel so as to ensure cross-wise displacement of the chain and its passage from one free wheel pinion to the other, and a second roller articulated in relation to the first so as to keep the drive chain under tension, gear change characterized by the fact that it comprises a guide pivoting freely on a spindle and straddling the portion of chain situated between the free wheel and the first roller. May be applied to all cycles.

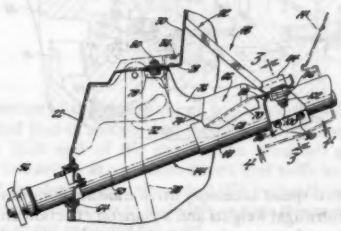
3,702,081
STEERING COLUMN ASSEMBLY

Gary L. Arnston, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 20, 1971, Ser. No. 173,493

Int. Cl. B62d *1/18*

U.S. Cl. 74—492 **2 Claims**



An automobile steering column assembly wherein an axially movable columnar member of a collapsible energy absorbing column structure has secured thereto a bracket having lugs thereon which lugs are releasably fastened to a combination guide and support member rigidly mounted on the vehicle body remote from the instrument panel structure of the latter. Under impact loading on the column structure the lugs are released for sliding movement relative to the combination member, the latter having a bearing surface and restraining flanges which constrain the bracket and lugs to move in a predetermined path of motion during collapse of the column structure to maintain the latter in an attitude effecting optimum energy absorbing performance.

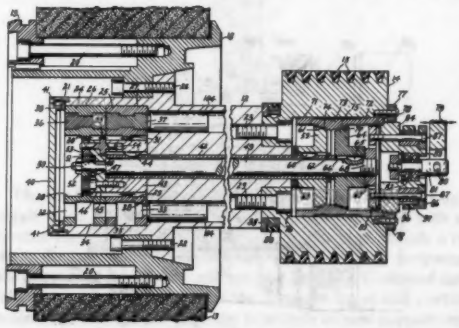
3,702,082
BALANCING DEVICE FOR ROTATING MEMBERS

Jacob Decker, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Nov. 13, 1969, Ser. No. 876,308

Int. Cl. F16f *15/00*

U.S. Cl. 74—573 **10 Claims**



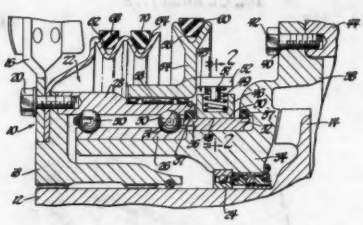
A device for balancing rotating members positioned on a rotatable shaft or spindle. A pair of movable balance weights

are positioned within the shaft or spindle and are movable both with respect to each other and in unison about the axis of rotation of the rotating mass. The device includes means for moving the balance weights while the structure within which they are housed is rotating.

3,702,083
TRANSMISSION

Lubomyr O. Hewko, Port Clinton, and Richard K. Kepple, Huron, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 14, 1971, Ser. No. 162,593
Int. Cl. F16h *5/42*
U.S. Cl. 74—752 E **10 Claims**

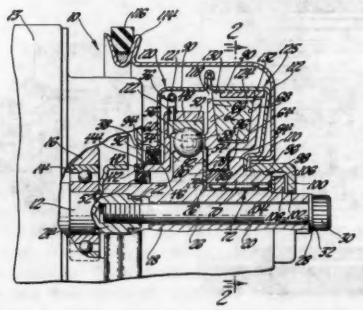


These two-speed accessory drive transmissions have spring-loaded centrifugal weights and a planetary friction unit including inner and outer ring members and intermediate ball planets. In one embodiment, the centrifugal weights are urged into frictional drive contact with the planetary carrier during low engine speeds for driving various engine accessories operatively connected to the outer ring member in overdrive. A one-way clutch is located between and connects the input pulley hub and the outer ring member upon disengagement of the centrifugal weights from the carrier under the action of centrifugal force. In an alternate embodiment, the inner ring member is connected to drive accessories, and the outer ring member is the reaction member. The centrifugal weights are remotely connected to drive the carrier via a connector member extending past the outer ring member of the planetary unit.

3,702,084
TRANSMISSION

Richard K. Kepple, Huron; Lubomyr O. Hewko, Port Clinton, and Arden W. Rogers, Marblehead, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed July 14, 1971, Ser. No. 162,592
Int. Cl. F16h *5/42*
U.S. Cl. 74—752 E **14 Claims**

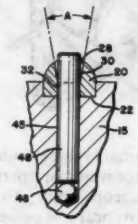


The illustrated two-speed accessory drive transmissions include wedge-shaped centrifugal weights and a planetary friction unit, with spring means for wedging the weights into frictional driving contact with clutching faces on the input means and/or the carrier of the planetary unit during low engine speeds for driving the output member in overdrive, and a one-way clutch for interconnecting the output and input in a direct drive relationship upon disengagement of the wedge-shaped weights from the carrier and/or input means clutching faces under the action of centrifugal force.

3,702,085
METHOD OF RIGIDLY SECURING MEMBERS WITH A RECESSED FASTENER

Hershel E. Hicok, 4636 Pine Village Drive, Orchard Lake, Mich.

Filed May 14, 1970, Ser. No. 37,249
Int. Cl. B25b *13/30*; B21d *39/00*
U.S. Cl. 76—107 A **6 Claims**

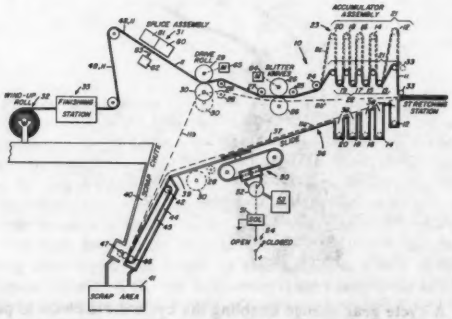


An elongated strip of bead stock is secured to a sheet metal draw die by first punching longitudinally spaced tapered holes within the strip with a punch having a diameter substantially smaller than the opening within the punch die. The strip is shaped and inserted within a groove formed within the draw die, and a pin-like fastener is inserted through each tapered hole and into a correspondingly aligned blind bore formed within the draw die. The outer end of each fastener is peened so that it expands both within the bore adjacent a hardened ball placed within the bore, and also within the tapered hole to effect a rigid and positive connection between the bead stock and the forming die. A punch tapered hole and a recessed tapered head fastener are also disclosed for rigidly connecting other adjacent members.

3,702,086
APPARATUS AND METHOD FOR HANDLING A WEB

Donald R. Moss, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 21, 1970, Ser. No. 99,885
Int. Cl. B26d *5/20*
U.S. Cl. 83—13 **10 Claims**



Apparatus and method for handling a plastic web during the manufacture thereof wherein after the web exits from a

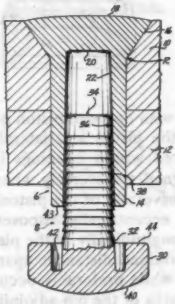
stretching station a slide is provided for diverting defective web material downward to a scrap handling area. When satisfactory material is thereafter produced the web may be automatically threaded into an accumulator assembly for take-up of the web so that the downstream end of the web may be stopped to permit the defective web material to be severed from the satisfactory web material. After being severed from the defective material the satisfactory material is spliced onto a web that has been previously threaded through to the finishing end of the apparatus where a wind-up roll is positioned for storage of the satisfactory web material.

The accumulator assembly comprises first and second sets of rollers wherein the first set is stationary and the second set is movable and positionable below the path of the defective web portion. The second set is movable from its lower position where it is nestable in recesses formed in the slide to allow the defective web to pass thereover, to a raised position where it is above the first set. The movement of the second set of rollers between the rollers of the first set is utilized to thread the web in a serpentine path between the rollers of the accumulator assembly.

3,702,087
DOUBLE SHANK BOLT

Hubert A. Schmitt, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed March 31, 1971, Ser. No. 129,773
Int. Cl. F16b *19/10*
U.S. Cl. 85—39 **1 Claim**



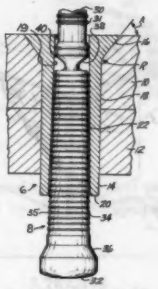
A high strength bolt type fastening system comprising an external member and an internal member which lockingly interengage within a hole passing through an overlapping pair of structural members upon application of longitudinal driving forces by standard riveting equipment. The external member is provided with a smooth conical recess having a taper of approximately .020 inch per inch to receive a matching solid conical stud portion of the internal member which has a serrated surface of correspondingly larger diameters than the recess to expand the external member and the hole and cause the serrations to lockingly engage the smooth wall of the recess to secure the joint.

3,702,088
DOUBLE SHANK BLIND BOLT

Hubert A. Schmitt, Auburn, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed March 31, 1971, Ser. No. 129,775
Int. Cl. F16b *10/19*
U.S. Cl. 85—77 **1 Claim**

A high strength blind bolt type radially expanding fastening system which may be completely installed from one side of the joint comprising an external 70° flush head sleeve member, and an internal conical pin member having a serrated surface with a break-off groove. The sleeve member is provided with a matching smooth conical inner wall having a taper of approximately 0.020 inch per inch and of correspondingly smaller diameter than that of the pin member. The oversized pin is inserted into the sleeve and the fastener assembly placed into a close tolerance hole from the flush side of the joint. Pulling and holding forces are applied to the pin and sleeve members respectively, and the pin is drawn into the sleeve; a serrated lead-in surface located ahead of the break-off groove acting to

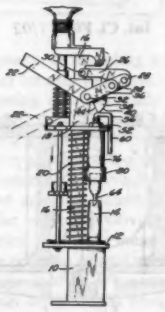


react a portion of the load required to expand the sleeve until the serrated lead-in surface and the break-off groove emerge from the flush end of the sleeve. The break-off groove is designed to fracture at a predetermined load sufficient to have expanded the sleeve approximately 0.005 inches thereby causing the serration notches to lockingly engage the smooth inner wall of the sleeve to secure the joint.

3,702,089
SHOTGUN SHELL RELOADER WITH SIZING DIE AND EJECTOR

Theodore J. Bachhuber, 725 Dayton St., Mayville, Wis.

Filed Jan. 27, 1971, Ser. No. 110,027
Int. Cl. F42b *33/04*
U.S. Cl. 86—32 **7 Claims**

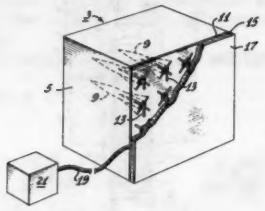


The tool-supporting carriage of a reloader is actuated by a toggle lever system having one of its links provided with an ejector cam. The tools mounted on the carriage include a resizing die having a tubular support, and a relatively reciprocable depriming punch and ejector bolt having a U-shaped cam follower portion in the path of the cam, one leg of said portion projecting through the carriage interiorly of said support and another leg thereof being guided and supported by the carriage to resist a lateral component of cam thrust while providing prolonged cam action in the ejection from the sizing die of the re-sized cartridge.

3,702,090
SHEET IGNITER

Charles T. Hoard, Oakland, Calif., assignor to MB Associates, San Ramon, Calif.

Continuation of Ser. No. 103,289, April 17, 1961, abandoned. This application Feb. 5, 1965, Ser. No. 433,534
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.813 **3 Claims**

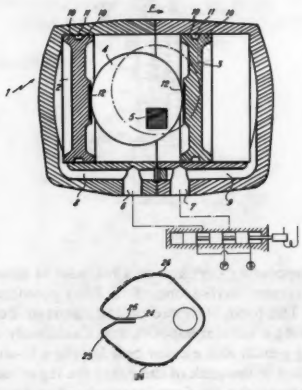


1. A holding, launching and ignition device for a plurality of miniature rockets comprising in combination:
a. a block of foam plastic;
b. a plurality of holes through said plastic, said holes extending from a front surface to a rear surface of the block;
c. a miniature rocket having a nozzle at the aft end thereof in each of said holes;
d. the aft end of each nozzle being substantially flush with the rear surface of the block;
e. a fuse extending from each of the rocket nozzles and bent to lie flush on the surface of the block;
f. a thin pyrotechnic layer spread over substantially the entire rear surface of the block;
g. said pyrotechnic layer encompassing all of the rocket fuses; and
h. means for igniting the pyrotechnic layer.

3,702,091
VALVE ACTUATOR MEANS

Jean Viaud, Paris, France, assignor to Societe Argenton and Societe Anonyme, Luxemburg, Luxembourg

Filed April 27, 1970, Ser. No. 32,121
Claims priority, application France, April 28, 1969, 6913427
Int. Cl. F01b *1/02*
U.S. Cl. 92—73 **1 Claim**

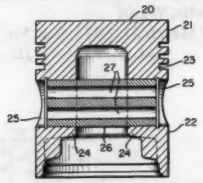


Improved fluid-operated valve actuator means for rotating a valve shaft in opposite directions through a given angle (preferably, 90° in the case of a quarter-turn valve). The invention is characterized by the provision of cam means connected with the output shaft and arranged in a chamber between a pair of freely movable operating pistons. When one end of the chamber is pressurized, the corresponding piston applies an operating force to the cam to rotate the cam and the output shaft through the given angle. In one embodiment, reversing valve means are provided for reversing the ends of the chamber that are pressurized and vented, respectively. In a second embodiment, one end of the chamber is alternately pressurized and vented, respectively, to achieve the desired rotation of the output shaft, the other end of the piston being enlarged to define a pressure fluid reservoir operable to return the output shaft to its initial position. In a third embodiment, spring means assist in returning the output shaft to its initial position.

3,702,092
PISTONS FOR ENGINES

Fred Zollner, Fort Wayne, Ind., assignor to Zollner Corporation, Fort Wayne, Ind.

Continuation of Ser. No. 850,819, Aug. 18, 1969, abandoned. This application May 3, 1971, Ser. No. 139,843
Int. Cl. F16j *1/14*; F16c *9/04*
U.S. Cl. 92—187 **6 Claims**



An engine piston with opposed piston pin bosses depending from the head of the piston and laterally spaced apart. A piston pin is secured within openings in the bosses, such openings being aligned transversely whereby the piston pin also is disposed transversely of the piston. The pin is formed with a plurality of eccentrically disposed holes of selected lengths extending longitudinally of the piston pin. Such holes are spaced predetermined distances apart and are arranged one above another while preferably occupying in whole less area than the solid area of the pin adjoining said holes. These holes in certain instances may be circular in shape and in number ranging for examples from two to six. In other instances the holes may be either rectilinear, oval or approximately triangular in shape and vary in number such for example as three or four thereof.

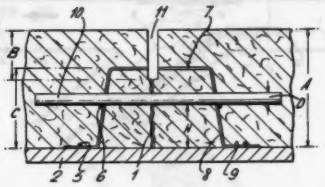
3,702,093
CONSTRUCTION OF CONCRETE ROAD WITH EXPANSION JOINTS

Guido Van de Loock, and Roeland Van Overbeke, both of Hemiksem, Belgium, assignors to S. A. Bekaert-Cockerill, Hemisken, Belgium

Filed April 2, 1971, Ser. No. 130,627
Claims priority, application Netherlands, April 3, 1970, 7004773
Int. Cl. E01c *7/00*
U.S. Cl. 94—8 **8 Claims**

A support apparatus for constructing a concrete road with expansion joints includes a plurality of like-oriented parallel-spaced inverted U-shaped cross members and at least one pair of support members connecting together the cross members with one of the support members being connected to each of the legs at an intermediate point on one side of the cross members and the other of the support members being connected to each of the opposite legs at an intermediate point on the opposite side of the cross members. In constructing a concrete road with expansion joints the support apparatus is first placed on a roadbed in general alignment with the desired location of

a particular expansion joint, self-oiling dowel bars are secured adjacent the cross members with the dowel bars resting on the support members and being aligned generally with the longitudinal axis of the road, the concrete is poured for finishing the



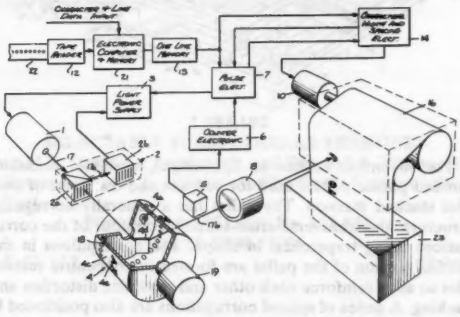
road, and a groove is then cut in the upper portion of the concrete, prior to the time when the concrete commences to shrink, to a depth sufficient to sever the central elements connecting the legs of the inverted U-shaped cross members but not to a depth sufficient to contact the dowel bars.

3,702,094

PHOTOGRAPHIC COMPOSITION SYSTEM

David J. Sinnott, Ringwood, and Donald E. Alecci, Pine Brook, both of N.J., assignors to Star-New Era, Inc., South Hackensack, N.J.

Filed Jan. 19, 1970, Ser. No. 3,718
Int. Cl. B41b *15/08*
U.S. Cl. 95—4.5 **5 Claims**



A photographic composition system having a pulsed light source that projects a beam of light through a font of characters to produce an image which is cast onto a sheet of film that is advanced by motor means. The controls for activating the motor provide for correct spacing between successive characters and are connected to a memory system which receives data input.

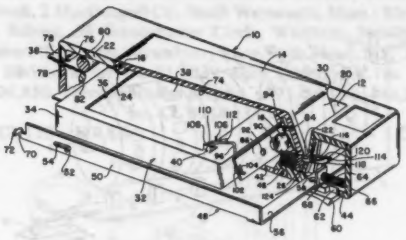
3,702,095

AUTOMATIC ADJUSTMENT OF AN EXPOSURE REGULATING DEVICE IN A COLLAPSIBLE CAMERA

Guilford Edwin Kindig, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 22, 1972, Ser. No. 227,983
Int. Cl. G03b *17/04, 9/02*
U.S. Cl. 95—11 R **8 Claims**

A collapsible camera having an adjustable exposure regulating device incorporated in its movable shutter assembly is loaded with a film container having coding means representing a characteristic of film therein. When the camera is collapsed, a code sensing element of the shutter assembly is located adjacent to the film container and is influenced by the coding means to adjust the exposure regulating device. Means are provided to require collapsing of the camera whenever the



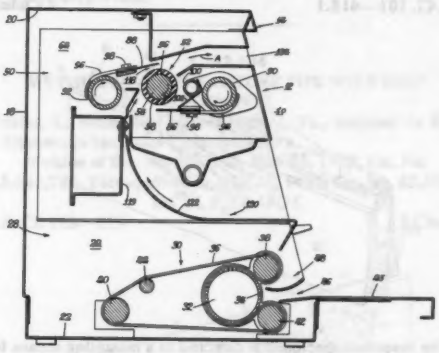
film container is replaced to ensure that the exposure regulating device is adjusted by the coding means of the new film container.

3,702,096

COPY APPARATUS

John S. Copeland, Buffalo Grove, Ill., assignor to Addressograph-Multigraph Corporation, Mt. Prospect, Ill.

Filed July 8, 1971, Ser. No. 160,618
Int. Cl. G03d *3/00*; G03b *27/30*
U.S. Cl. 95—89 R **12 Claims**



A diazotype copy machine including a developer unit having an applicator roller for applying developer to a copy sheet and means for dispensing a substantially uniform coating of developer onto the surface of said applicator roller including means movable toward and away from contact with said applicator roller between an engaged and a released position. Control means is provided for moving said dispenser means between said engaged and said released position and drive means is provided for normally driving said roller in one direction to make copies. Said drive means includes slip clutch means permitting free rotation of said applicator roller in said one direction relative to said drive means, and means is provided for reversing said drive means whereby said applicator roller may be freely rotated in both directions to facilitate removal of a copy sheet jam around said roller.

3,702,097

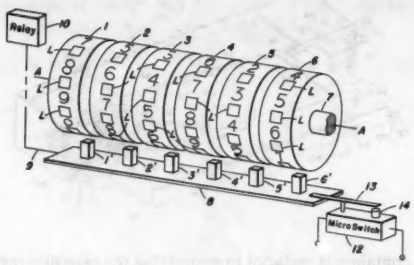
ANTI-HAMMER APPARATUS FOR POWERED IMPRINTERS

Lloyd E. St. Jean, Huntington, N.Y., assignor to Interface Industries, Inc., Hauppauge, N.Y.

Filed Aug. 19, 1971, Ser. No. 173,144
Int. Cl. B41j *7/34*
U.S. Cl. 101—99 **10 Claims**

Anti-hammer apparatus which provides only a selected interval in which the print drums of a powered imprinter may be

locked in a fixed relationship is provided in accordance with the teachings of the present invention. Upon a failure to achieve locking within such selected interval, a locking circuit



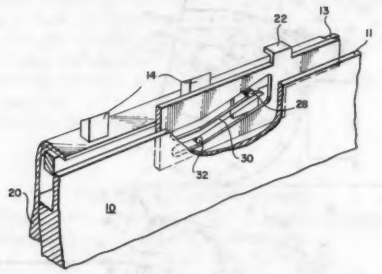
is disabled to prevent repeated attempts at locking from damaging the print drums and/or the locking mechanism therefor.

3,702,098

MOUNTING FOR THIN PRINTING PLATES

William H. Eburn, Jr., Westport, Conn., assignor to W. R. Grace & Co., New York, N.Y.

Filed March 5, 1971, Ser. No. 121,358
Int. Cl. B41f *1/36*
U.S. Cl. 101—415.1 **4 Claims**



The invention disclosed is directed to a mounting means for detachably mounting flexible thin printing plates. Printing plates are detachably mounted on at least one terminal edge of the backing plate or saddle by means of a studded plate securing bar which is spring biased by a slidable bar positioning element. The co-action of the positioning element and the securing bar both disposed within the thickners of the backing plate or saddle provides an efficient highly acceptable means for securing a thin printing plate in position.

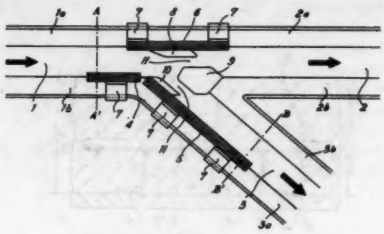
3,702,099

ELECTROMAGNETIC JUNCTION, INTER ALIA FOR AN OVERHEAD DUO-RAIL CONVEYOR

Pierre A. Ricaud, Chatou, and Simon A. Cynober, Paris, both of France, assignors to Jeumont-Schneider, Paris, France

Filed Nov. 21, 1969, Ser. No. 878,758
Claims priority, application France, Nov. 22, 1968, 68174834
Int. Cl. E01b *25/26*
U.S. Cl. 104—105 **8 Claims**

An electromagnetic junction of use inter alia for an overhead duo-rail conveyor moving loads without transfer chain and moving blading, comprising: for each direction upstream and downstream of the junction, a stationary polyphase field system extending parallel to the rail of the particular junction branch concerned and energized by a polyphase a.c. supply; for each load to be carried and sent over the junction, an armature in the form of an electrically conductive plate secured to or forming part of the load; means for bringing each load as far as the junction entry and for removing the same at the junction exit, and a switching facility so devised as, when a



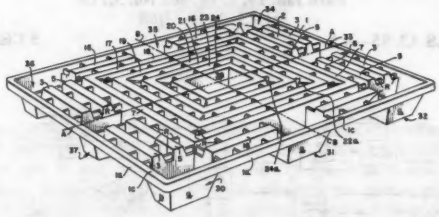
load enters the junction, to energize simultaneously the junction upstream branch field and the field of that downstream branch of the junction to which the load is required to go.

3,702,100

MOLDED PALLET

Thomas P. Wharton, Neehah, Wis., assignor to Menasha Corporation

Filed April 5, 1971, Ser. No. 131,087
Int. Cl. B65d *19/38*
U.S. Cl. 108—58 **10 Claims**



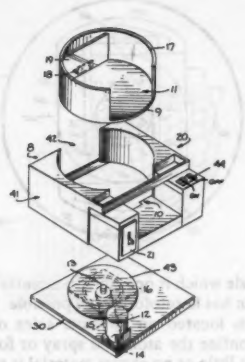
The invention relates to lightweight, nestable, reusable, molded plastic pallets used for support and transport of articles stacked thereon. The pallet has a generally corrugated structure, the transverse cross-sectional contour of the corrugations being trapezoidal in shape. The corrugations in the medial portion of the pallet are formed in concentric rectangles so as to reinforce each other and minimize distortion and racking. A series of spaced corrugations are also positioned in parallel relation to each side of the pallet. All corrugations are reinforced in a direction opposite to the longitudinal axis of the corrugations by integral spaced ribs between the corrugations at the top face and lower face of the platform. These reinforcing ribs are aligned so as to provide continuous spaced beams or extending through the pallet body lengthwise and crosswise to provide maximum strength and stiffness in the direction opposite to the axes of the corrugations. The construction results in omni-directional strength and stiffness of the pallet. The ribs are also of such height as to act as stacking supports when the pallets are nested to provide strength to hold and distribute the weight of the stacked pallets and also to prevent jamming and sticking together of one pallet within another. The pallet is provided with a plurality of spaced integral hollow feet depending from the bottom face of the platform which have a rectangular truncated pyramidal contour. The inner bottom walls of the feet are provided with integral reinforcing cross-ribs. The side walls of the feet are also reinforced by the adjacent ends of the corrugations integrally molded therewith. The pallet is also provided at its outer periphery with a continuous integral L-shaped turned-down channel which is also reinforced with spaced transverse ribs to protect the edges of the pallet against abuse or damage by accidental mechanical impact.

3,702,101

TELLER MECHANISM

George E. Moore, Jamestown, N.Y., assignor to Watson Manufacturing Company, Inc., Jamestown, N.Y.

Filed Dec. 28, 1970, Ser. No. 101,593
Int. Cl. E06b 7/32
U.S. Cl. 109—19 16 Claims



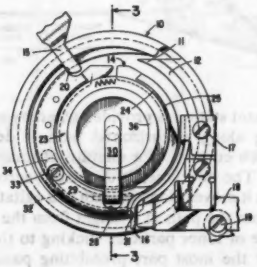
A theft proof teller mechanism comprised of a rotatable plate with a bullet resistant upstanding cylindrical wall with an access opening. The access opening can be presented to either the public or the cashier by rotation of the cylinder through the use of a push button motor which is preferably automatically stopped after 180° rotation. A slip clutch in the drive motor drive provides for "finger pinch" protection.

3,702,102

SELECTABLE BOBBIN THREAD TENSIONS

Donald R. Davidson, Parsippany, and Edmund B. Wilson, III, Dover, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed July 19, 1971, Ser. No. 163,840
Int. Cl. D05b 57/14
U.S. Cl. 112—184 3 Claims



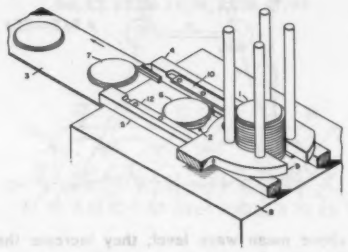
A method and apparatus for obtaining a variety of selectable bobbin thread tensions in a lockstitch sewing machine wherein bobbin thread tension is achieved by resisting bobbin rotation by pressing a bobbin hold down arm against an annular protuberance on a flange of the bobbin and concentric with the center of rotation of the bobbin, replacing the bobbin with one similarly constructed but having its protuberance at a suitable different radius when a change in bobbin tension is required.

3,702,103

SELF-ADJUSTING CUT-OFF KNIFE

Raymond E. Price, 64 Hoitt Road, Belmont, Mass.; Clifford F. Tirrell, 2 MacDougall Ct., South Weymouth, Mass.; Richard C. Adams, 36 Woodchester Circle, Waltham, Mass., and Robert W. George, Strawberry Lane, Belle Mead, N.J.

Division of Ser. No. 813,039, April 3, 1969, Pat. No. 3,606,850. This application May 24, 1971, Ser. No. 146,229
Int. Cl. B21d 43/16
U.S. Cl. 113—114 BE 1 Claim



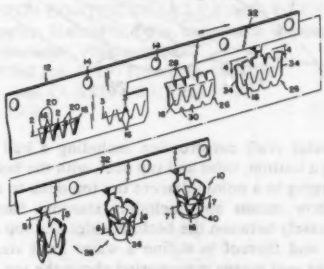
A pair of cut-off knives for stripping the lower closure of a vertical stack of closures is floated on a spring shim to be able to ride between the curl portions of closures one of whose curl is so oversized as to otherwise cause the knives to interfere with the curl portion.

3,702,104

METHOD OF MANUFACTURE FOR WIRE GRIP TERMINAL

Weldon L. Brubaker, Mechanicsburg, Pa., assignor to Berg Electronics Inc., New Cumberland, Pa.

Division of Ser. No. 851,030, Aug. 18, 1969, Pat. No. 3,601,786. This application Aug. 20, 1970, Ser. No. 65,406
Int. Cl. B21d 53/36
U.S. Cl. 113—119 2 Claims



A wire grip circuit board eyelet with wire-engaging burrs on the edges of the wire grip fingers and the method of making the same.

3,702,105

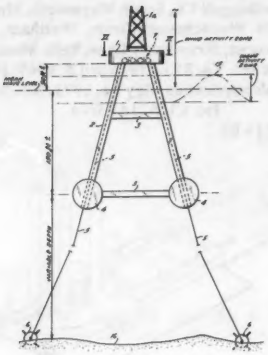
DEEP WATER DRILLING RIG

Samuel I. Feldman, Fairlawn, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed March 17, 1971, Ser. No. 125,297
Int. Cl. B63b 35/00
U.S. Cl. 114—0.5 D 4 Claims

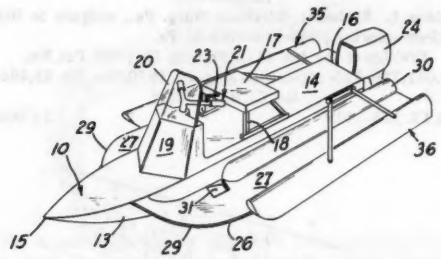
A deepwater float has a supporting platform and downwardly depending legs which carry buoyancy tanks arranged annularly with reference to the platform, or a single ring-shaped buoyancy tank. Tethers secure the float against lateral displacement with reference to a selected portion of the deepwater floor. Gyroscopic controls normally maintain

the tethers at a length and the buoyancy at such positive value that the tethers are taut and the platform is at a selected



distance above mean wave level; they increase the tether length and positive buoyancy in automatic response to an increase in the height of the mean wave level.

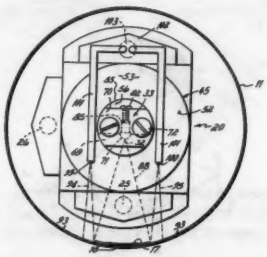
3,702,106
WATER CRAFT CONSTRUCTION
Donald L. Wilder, Route No. 2, Box 406, Gainesville, Ga.
Filed Jan. 11, 1971, Ser. No. 105,282
Int. Cl. B63b *35/00, 43/14*
U.S. Cl. 115—70 **11 Claims**



A water craft construction including a hull body portion having a bottom, sides and top deck with the bottom and sides converging to a point adjacent the top deck to define a water craft bow means and including transom means extending transversely between the bottom, sides and top deck adjacent a rear end thereof to define a water craft stern means. An operator seat means is supported above the top deck adjacent an intermediate portion of the hull means and includes an operator control means supported on the top deck forwardly of the operator seat means. Means are provided on the transom means for supporting a power motor means and outrigger pontoon means are supported on opposite lateral sides of said hull body portion.

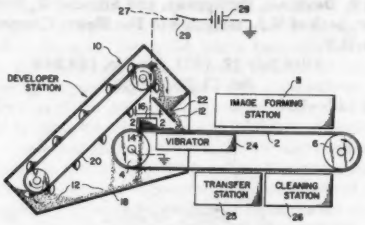
3,702,107
AN APPARATUS FOR STRIPING INSIDE SEAMS OF CANS
Alvin A. Rood, Westlake; Edwin F. Hogstrom, and William C. Stumphauzer, both of Sheffield Lake, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio
Filed Jan. 19, 1971, Ser. No. 107,632
Int. Cl. B05c *11/00*
U.S. Cl. 118—2 **13 Claims**

An apparatus for applying an impervious protective coating over the seams of cylindrical metal can bodies either before or after the seams are welded, soldered, or cemented and prior to spray coating the complete interior of the bodies. The apparatus is operable to intermittently apply an airless spray to the interior seams of the cans as they continuously move past an airless spray gun secured to the end of a stubhorn of a can forming line. The apparatus includes a new and improved air-



less spray nozzle which is operable to atomize the spray nearer the nozzle than has heretofore been possible. It also includes a pair of air jets located on opposite sides of the spray and operable to confine the atomized spray or fog to the seam of the can so that little or no excess material is sprayed onto that portion of the can located adjacent the seam.

3,702,108
IMAGE DEVELOPMENT STATION
Conrad Altmann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,818
Int. Cl. B05b *5/02;* **G03g** *13/00*
U.S. Cl. 118—637 **13 Claims**



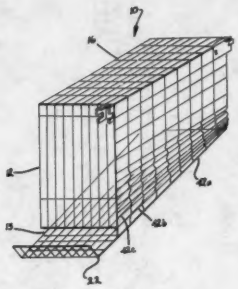
A development station is provided whereby an electrostatic image moving along a horizontal path is developed by a developer which consists of a mixture of toner particles and carrier beads. The developer is dispensed across the electrostatic image as it moves along its path and agitated by a barrier extending across the path at a height from the image path to permit passage of toner particles sticking to the electrostatic image but for the most part prohibiting passage of carrier beads. This barrier may include a variety of shapes such as a flat blade extending at an angle across the developer, a curved blade, a counter-rotating paddle wheel, a plurality of blades wherein the first blade is at a height to allow both toner and carrier beads to pass thereunder and a second blade is at a height to permit only toner particles adhering to the electrostatic image to pass thereunder, or the blade may be comb-shaped so that a portion of the excess developer and carrier beads may move along with the electrostatic image. The blade can be used to provide solid area development by applying a potential thereto.

3,702,109

ANIMAL CAGE CONSTRUCTION AND METHOD FOR CONSTRUCTION PANEL THEREFORE

Robert L. Van Huis, Zeeland, Mich., assignor to Big Dutchman, Inc., Zeeland, Mich.

Filed July 28, 1971, Ser. No. 166,876
Int. Cl. A01k *31/06*
U.S. Cl. 119—17 11 Claims



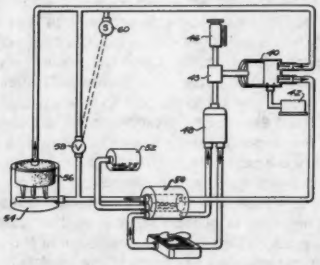
An animal cage construction having a plurality of sides forming an enclosure. At least some of the sides are constructed of a wire fabric having at least one terminal edge inclined at angles to the direction in which the wires forming the fabric extend. The terminal edge is formed by predetermined ones of the wires being crimped to give the desired shape of the terminal edge.

3,702,110

CLOSED CYCLE ENGINE SYSTEM

Lawrence C. Hoffman, Azusa; Mark I. Rudnicki, Glendora, and Howard W. Williams, San Bernardino, all of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed Nov. 30, 1970, Ser. No. 93,677
Int. Cl. F02b *29/00*
U.S. Cl. 123—119 A 15 Claims



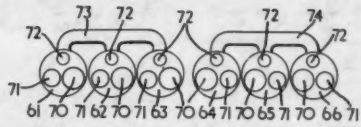
Disclosed is an engine, preferably of the diesel type, operating in a closed cycle system in which there is generated a mixture of gaseous oxygen and water vapor for its "breathing." The generation of this mixture uses the engine exhaust products, which comprises mainly, carbon dioxide, oxygen and water vapor. This synthetic "air" combusts with the diesel fuel to drive, for instance, an electrical generator. The system incorporates units connected to the engine exhaust which employ the carbon dioxide to produce new oxygen, condense the water vapor and recycle the unused oxygen, and a further provision for control of the oxygen production.

3,702,111

ATMOSPHERIC POLLUTION CONTROL ARRANGEMENT FOR INTERNAL COMBUSTION ENGINE

John Harold Weaving, and Cecil David Haynes, both of c/o British Leyland Motor Corp. Limited, Group Research Laboratory, (Atmospheric Pollution Control) Juguar Works, Browns Lane, Coventry, England

Filed Feb. 19, 1971, Ser. No. 116,829
Claims priority, application Great Britain, Feb. 19, 1970, 7,908/70
Int. Cl. F02m *25/06*; F02b *47/08*
U.S. Cl. 123—119 A 4 Claims



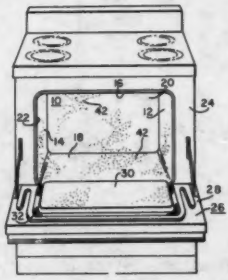
A multi-cylinder internal combustion engine having a valve in addition to normal inlet and exhaust valves in the cylinders of the engine through which part of the gaseous products of combustion are removable, before they have passed through the exhaust system of the engine and are re-introduced into another cylinder of the engine after closure of the inlet valve thereof. The additional valves of the cylinders are interconnected in pairs by manifolds to permit this recirculation of exhaust gases. By recirculating part of the exhaust gases from each cylinder in this way the proportion of oxides of nitrogen in the final exhaust gases from the engine is reduced.

3,702,112

DOOR FOR CONTINUOUS-CLEANING OVEN

Arthur T. Keppler, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 5, 1971, Ser. No. 104,084
Int. Cl. A21b *1/00*; F24c *15/02*
U.S. Cl. 126—19 R 3 Claims

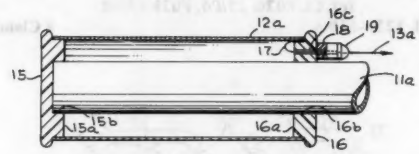


An oven of the continuous-cleaning type in which the oven door therefor is provided with a muffle panel to which a continuous-cleaning coating is applied while the portion of the door inner panel which borders the muffle panel has a smooth-surfaced porcelain enamel applied thereto.

3,702,113
ELECTRODE APPARATUS FOR EXERCISER HANDLEBAR

Walter Vincent Blockley, 27727 Pacific Coast Highway, Malibu, Calif.

Filed Aug. 20, 1969, Ser. No. 853,233
Int. Cl. A61b 5/04
U.S. Cl. 128—2.06 E 16 Claims

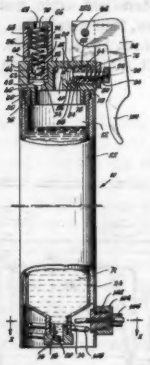


An electrode apparatus is disclosed for monitoring the condition of the heart while the subject is in the process of exercising. The electrodes are mounted on the handlebar or handrail of the exercise machine and are grasped with the hands to produce the electrical signals corresponding to the functioning of the heart.

3,702,114
LIQUID REFRIGERANT SPRAY DEVICE

Setrag A. Zacarian, Springfield, Mass., assignor to Frigitronics of Conn., Inc., Shelton, Conn.

Filed Aug. 26, 1970, Ser. No. 67,046
Int. Cl. A61b 17/36; A61m 11/00
U.S. Cl. 128—173 R 6 Claims

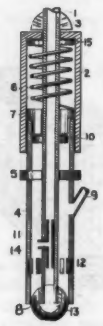


There is disclosed medical apparatus for spraying a low boiling point liquid refrigerant directly onto a site to be treated. It comprises a container which is vented but has a valve for selectively closing the vent, normal boiling of the liquid thereby resulting in self pressurization. A discharge orifice at the bottom of the container leads through an evaporating coil to an applicator, to which may be connected interchangeable needles. The evaporating coil permits partial vaporization of the refrigerant so that the spray is a liquid-gas mixture with little propensity to drip or run from the point of contact.

3,702,115
DEVICE FOR SUCTIONING

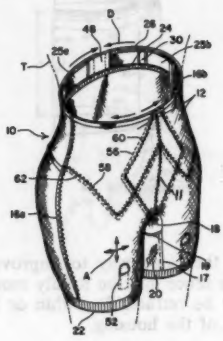
Harold Elcaness, P.O. Box 426 Payne Rd., Block Island, R.I.

Filed Aug. 7, 1970, Ser. No. 61,879
Int. Cl. A61m 4/00
U.S. Cl. 128—276 1 Claim



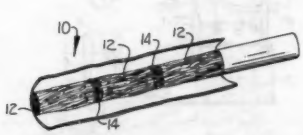
The suction device incorporating the present invention has a telescoping upper and lower casing and an interposed carrier-director with fixtures attached for the purpose of controlling suction and the amounts of fluid allowed into the instrument, and depending on the controlled amount of protrusion of the carrier-director, control of suctioning and the amounts of fluid to the parts suctioned is obtained. Means of releasing unwanted suctioned matter is provided for in the device. The carrier-director is hollow and carries fluid from a source into the distal end, the outlet is guarded by a t-tube which is occluded when the outlet is brought in contact with a hollow ring fixed to the lower casing. At the end of the carrier-director is a ball which occludes the opening of the lower casing at the distal end. Depending on the position of the ball relative to the mouth of the lower casing and the opening in the carrier-director to the fixed ring, the fluid flows readily when the opening of the t-tube is not occluded. The constant suction applied to the outlet in the lower casing, is varied in effect by the relative position of the ball. When the ball occludes the mouth of the lower casing, the suction is applied only to the contents of the lower casing. When the ball is protruded a fixed distance when the upper casing meets a fixed obstacle on the lower casing, this distance is also the amount required to bring the t-tube into the ring thus shutting off inlet of fluid. The suction is now applied to the part to be suctioned. Further protrusion a fixed distance by pressure on a knob on the proximal part of the director-carrier allows both suction and fluid to be applied to the part to be suctioned. Thus unwanted intrusion of a part being suctioned is pushed further away and is washed away by a flush of fluid following the release which occurs when the t-tube is pushed away from the lumen of the ring. When suction is desired to be continued in the part to be suctioned the pressure on the knob is released and a spring-like fixture on the upper end of the carrier brings the carrier director back to the position of the upper casing being compressed against the lower casing. If suction to the part of the organ being suctioned is desired to be interrupted, release of the pressure on the upper casing allows the carrier-director to return the position of the uncompressed spring-like device now suction is applied only to the suctioned material by reason of the lower casing being closed off from the part to be suctioned by the ball on the end of the returned carrier-director, and fluid flows freely to dilute the suctioned material and to pressure the material out of the suction egress tube. This occurs because the t-tube on the carrier-director is carried away from the ring, so the outlet of fluid is free.

3,702,116
UNDERGARMENT WITH ADJUSTABLE WAIST SIZE AND BACK SUPPORT
Jack Panes, Bayside, N.Y., assignor to Magic Charm, Inc., New York, N.Y.
Filed March 13, 1970, Ser. No. 19,333
Int. Cl. A41c *1/00*
U.S. Cl. 128—548 10 Claims



An undergarment is made of two-way stretch power net material. The undergarment has an upper tubular portion which encircles the wearer's waist. The front of the undergarment extends higher than the rear. A pair of auxiliary two-way stretch belt panels reinforced by flexible strips extend around the back from lateral seams and are adjustably engaged by fasteners, to help take in the abdomen, creating a custom-fit waist size, to help support the lower back of the wearer, and to keep the undergarment from riding up or down.

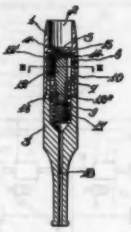
3,702,117
CIGARETTE
Theodore H. Borthwick, 2501–D Queen St., Winston-Salem, N.C. 27103
Filed Nov. 23, 1970, Ser. No. 91,940
Int. Cl. A24d *1/10*
U.S. Cl. 131—4 A 4 Claims



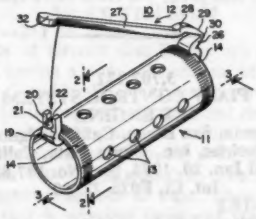
A significant portion of a length of a cigarette is preserved, should the cigarette be left unattended by a smoker who is preoccupied with other matters, by the provision of flammability barriers within the length of the cigarette which divide the length of the cigarette into sections. Due to a particular relationship among the combustion temperatures of the tobacco filling for the cigarette and the flammability barriers, use of the cigarette in a normal manner proceeds uninhibited while an unattended cigarette is extinguished.

3,702,118
CIGARETTE HOLDER WITH TAR-COLLECTING INSERT
Katuhisa Terasaki, 43 Kohmiya-cho, Edogawa-ku, Tokyo, Japan
Continuation of application Ser. No. 807,628, Mar. 17, 1969. This application Sept. 8, 1970, Ser. No. 70,562
Int. Cl. A24f *1/16, 7/04*
U.S. Cl. 131—209 6 Claims

A tar-collecting insert consisting of a first and a second insert member, said first insert member being inserted in the bore of the cigarette holding member and being formed with an open-topped and bottom-perforated walled cylindrical piece, a detachable cover having a central narrow through-hole and a flat-topped solid rod extending axially and centrally through said bottom wall, the upwardly extending portion of said rod leaving a narrow clearance between its flat top and the lower face of said cover, said flat top facing said central narrow hole of the cover, the downwardly extending portion being received in a bore in said second insert member which, in turn, is inserted in the bore of the mouthpiece member and is hollow and cylindrical and has a helical thread provided integrally around its external surface to provide a helical passageway with the inner wall of the mouthpiece member.



3,702,119
HAIR CURLER
Nathan L. Volomon, Cedar Lane, Englewood, N.J. 07631
Filed Feb. 9, 1972, Ser. No. 224,691
Int. Cl. A45d *2/14*
U.S. Cl. 132—41 B 9 Claims



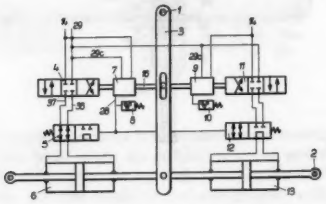
A hair curler includes a perforate thin walled tubular mandrel and a hair clamp which includes a stiff first arm extending along the inner face of the mandrel and spaced from the opposite side of the mandrel and retained to the mandrel by a pair of legs projecting from opposite ends of the first arm and having recesses which peripherally slidably engage the opposite borders of the mandrel. The clamp arm is restricted against longitudinal movement and is peripherally slidable about the mandrel. A second clamp arm is self-hinged to one of the legs and is swingably between closed releasable engagement with the opposite leg and an open condition.

3,702,120

METHOD AND MEANS FOR IMPROVING AND INCREASING THE RELIABILITY OF HYDRAULIC AND PNEUMATIC MULTICIRCUIT CONTROL SYSTEMS

Kurt Redeker, Mainz, Germany assignor to Feinmechanische Werke Mainz G.m.b.H., Mainz am Rhine, Germany

Filed June 10, 1971, Ser. No. 151,772
Claims priority, application Germany, Sept. 5, 1970, P 20 44 053.3
Int. Cl. F16k 11/10
U.S. Cl. 137—1 11 Claims



The present invention relates to method and means for improving and increasing the reliability of hydraulic and pneumatic multicircuit control systems, in particular upon failure of a respective circuit in such systems, the input circuit when the system becomes inoperative, releasing signals for an uncoupling or disconnecting operation of the input circuit, and automatically effectuating a changeover to an auxiliary circuit system. The invention further relates to adjusting the drives operated by a fluid medium, e.g., acting on pistons, linear as well as rotary motors, which are actuated through control slide valve aggregates or units which are present at least in a dual arrangement. The duality includes dual energy supply, as well as double-acting signal circuit system, the operational elements thereof being used for the transformation of signals. The mechanical input signal and the feedback of the output signal are applied simultaneously and are substantially of the same magnitude with respect to the control slide valve aggregates arranged in multiple circuitries.

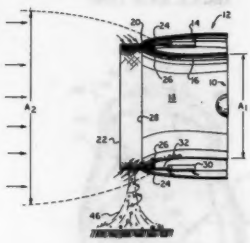
3,702,121

INLET FLOW CONTROL SYSTEM FOR JET ENGINE

Victor Millman, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Jan. 20, 1971, Ser. No. 107,887
Int. Cl. F02b 27/00
U.S. Cl. 137—15.1 11 Claims

System includes a housing which comprises all or part on an inlet throat for directing flow of intake air from ambient atmosphere to compressor of jet engine. Housing has thin, slightly rounded inlet lip. At standstill or low ground roll speeds, compressor demand pulls air in laterally across inlet lip and this air breaks away from housing inner wall at small curvature of lip, disturbing total flow and often causing compressor stall and engine flameout. Perforate fence, which is preferably wire screen, extends along periphery of inlet lip in fore and aft attitude, and laterally flowing air passes through it. Fence produces fine turbulence and high velocity and energy which energizes the boundary layer within the throat and improves airflow to compressor. At high cruise speeds, the excess air adjacent to the stream tube flows laterally outward across the inlet lip and the same perforate fence strains this airflow and energizes the boundary layer on the outer surface of the housing to delay the drag rise of the inlet lip. In a strong cross wind, the same fence acts



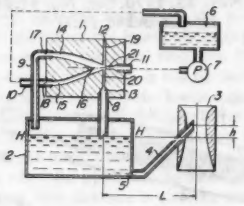
in substantially the same way to improve the recovery of the inlet. The fence may be fixedly mounted in active position or may be retractable within or flush upon the forward portion of the housing.

3,702,122

LIQUID LEVEL CONTROLLING APPARATUS

Masanori Hanaoka, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan

Filed Dec. 15, 1970, Ser. No. 98,405
Claims priority, application Japan, Mar. 14, 1970, 45/21,605; July 3, 1970, 45/58,432
Int. Cl. F15c 1/08
U.S. Cl. 137—81.5 6 Claims



A wall attachment logic element is interposed between a fuel tank and a fuel regulating container for the purpose of controlling the liquid level in said fuel regulating container, and when the liquid level therein has fallen below a set level, a pressure variation occurs at the point of divergence of the ducts formed in said fluidics or fluidic element to direct the liquid being delivered from a fuel pump so as to be introduced into a conduit leading to said container, whereas when the liquid level has risen above said set level, the liquid passes through a separate duct in said fluidics and is returned to said fuel tank through a return pipe, and concurrently the liquid in said container is sucked up and delivered into the return pipe, whereby the surface of the liquid in the container may be maintained at the set level.

ERRATA

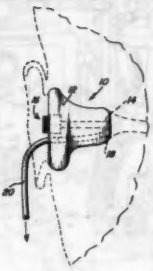
For Classes 137—469 thru 176—3 see:
Patents Nos. 3,702,141 thru 3,702,163

3,702,123

VENTED HEARING AID EAR MOLD

John T. Macken, 5800 Chowen, Edina, Minn. 55424, and Albert H. Schaefer, 7418 Girard, Richfield, Minn. 55423

Filed Sept. 9, 1971, Ser. No. 179,048
Int. Cl. G02k 13/00; H04r 25/00
U.S. Cl. 181—23 17 Claims



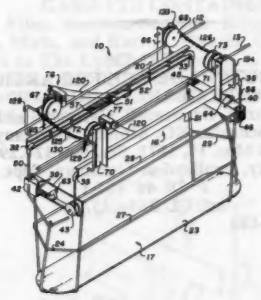
An adjustable vented ear mold assembly for use with hearing aids, and the like said ear mold assembly including an acoustical valve with means providing an infinite number of adjustments or tuning settings by a wearer to achieve the most desirable acoustic results.

3,702,124

TRAVERSING SKIPS

Stanley E. Highland, 316 Wellington Ave., Chilliwack, British Columbia, Canada

Filed July 20, 1970, Ser. No. 56,282
Int. Cl. B61b 7/06; E01b 25/16; E04g 3/16
U.S. Cl. 182—14 34 Claims



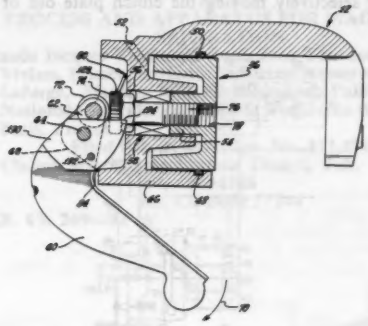
A movable skip adapted to be removably mounted on power lines and the like and to carry a man who can pull the skip along the lines or operate a motor to run the skip therealong. The skip includes a cage for carrying the operator, and suspension means for maintaining the cage level when the remainder of the skip is not level due to the position of the lines. The skip has supporting pulleys adapted to move along the lines, and the arrangement is such that the operator can use his weight to help lift the pulleys successively over any hardware connected to the lines.

3,702,125

COMPENSATING HYDRAULIC BRAKE STRUCTURE WITH MANUAL OVERRIDE

Dan W. Jeffries, Los Angeles, Calif., assignor of a fractional part interest to Harold W. Nash, Los Angeles, Calif.

Filed June 18, 1970, Ser. No. 47,461
Int. Cl. F16d 65/52
U.S. Cl. 188—71.8 7 Claims



The improved compensator utilizes a friction ring that locks up in a small bore in the caliper part located behind the piston. A long mounting screw projects rearwardly from the piston and extends through the friction ring and the caliper bore. A double acting spring suspension provides a floating mounting for the piston and determines its normal axial position. One section of the spring suspension is interposed between the friction ring and the back of the piston and acts as a memory spring; the other section of the spring suspension is interposed between the friction ring on the opposite side and an adjustment nut carried on the mounting screw. The adjustment nut is exteriorly accessible.

3,702,126

FRICTION PAIR FOR USE IN AIRCRAFT BRAKES

Phillip R. Eklund, 991 Stanwick Drive 45430, and Joseph E. Krysiak, 510 Wilmington Ave. 45420, both of Dayton, Ohio

No Drawing. Filed Dec. 23, 1970, Ser. No. 101,199
Int. Cl. F16d 69/02
U.S. Cl. 188—251 M 4 Claims

Rotor discs of aircraft disc brakes are constructed of alloyed steel having a nominal hardness of at least about 64 Rockwell C and brake pucks are constructed of either high purity aluminum oxide or stabilized zirconium oxide. The friction pairs thus produced exhibit a coefficient of friction which varies less than 0.1 over the temperature range of from 400° F. to 1000° F. The materials used also exhibit great resistance to wear. Thus, this invention is useful in that it provides improved friction pairs for use in aircraft disc brakes.

3,702,127

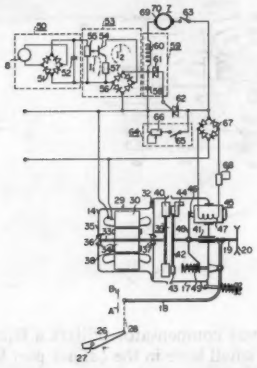
CLUTCH-BRAKE-MOTOR ASSEMBLY HAVING MECHANICAL AND ELECTROMAGNETIC ACTUATORS

Masahiro Yokoyama, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

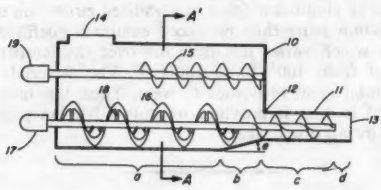
Filed Sept. 15, 1970, Ser. No. 72,338
Claims priority, application Japan, Sept. 26, 1969, 44/76,714
Int. Cl. F16d 67/02
U.S. Cl. 192—18 B 4 Claims

A clutch-brake-motor assembly comprises an electric motor having a rotary output shaft, a flywheel connected

to the output shaft, a brake device positioned in spaced-apart relationship from the flywheel, a clutch plate alternatively movable into and out of engagement with the flywheel and the brake device, a rotary output member connected to the clutch plate and rotationally driven by the electric motor whenever the clutch plate engages with the flywheel, a biasing spring normally biasing the clutch plate into engagement with the brake device to brake the output member against rotational movement, and actuating means for selectively moving the clutch plate out of engagement with the brake device and into engagement with the flywheel. The actuating means comprises a mechanical system for initially overriding the biasing spring and starting movement of the clutch plate towards the flywheel and an electromagnetic system energizable in response to actuation of the mechanical system for electromagnetically continuing movement of the clutch plate towards the flywheel. The magnitude of the electromagnetic force almost equals and counteracts the magnitude of the biasing spring force and therefore only a small mechanical force is required once the electromagnetic system is energized.

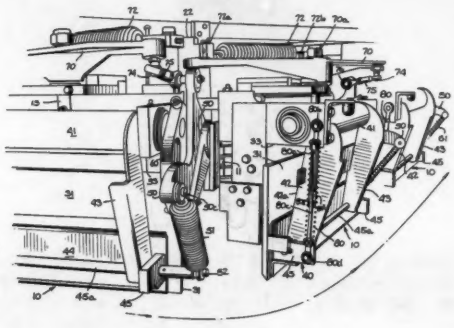


3,702,128
SOLIDS FEEDER APPARATUS
Frederick J. Trotter, Jr., Bay City, Tex., assignor to Celanese Corporation, New York, N.Y.
Continuation of abandoned application Ser. No. 779,159, Nov. 26, 1968. This application Mar. 26, 1971, Ser. No. 128,522
Int. Cl. B65g *47/16, 33/00*
U.S. Cl. 198—64 **6 Claims**



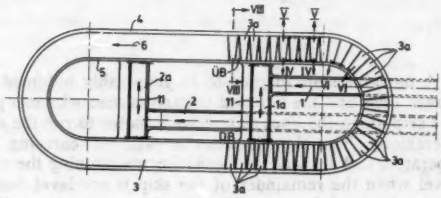
A screw conveyor-type apparatus for feeding granular solids from a feed vessel having a U-trough bottom to a pressurized system via a circular conduit. The apparatus contains a cantilevered feed conveyor screw suspended in the U-trough and extending a portion of the way into the circular conduit as well as an overhead reverse conveyor screw which recycles solids away from the mouth of the circular conduit. The portion of the feed screw within the feed vessel is larger than that portion extending into the circular conduit.

3,702,129
MECHANICAL BOOK CLAMP
Richard B. Hawkes, Easton, and Donald P. Johnson, Bethlehem, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio
Filed Oct. 19, 1970, Ser. No. 81,741
Int. Cl. B65g *15/58*
U.S. Cl. 198—180 **14 Claims**



A book binding machine is provided with a plurality of interconnected book clamps each of which is coupled to and driven by means of an endless chain along a path which extends in a loop about the machine. Each of the clamps is guided along the path by means of rollers which are in engagement with a guide track. Each of the clamps are comprised of an outer clamp assembly pivotally mounted along a horizontally extending axis to an inner clamp assembly. Each of the clamp assemblies has a clamp plate disposed thereon in a facing relationship with one another. A lever arm rotatable about an axis parallel to the axis of rotation of the outer clamp is coupled thereto in order to effect rotation of the outer clamp with respect to the inner clamp so that a book may be bound therebetween. When the outer clamp assembly is swung open about the horizontal pivotal axis, a book can be moved conveniently to a position adjacent to the inner clamp assembly.

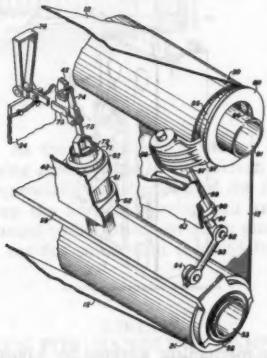
3,702,130
DISTRIBUTING DEVICE FOR ARTICLES, PARTICULARLY LUGGAGE
Ernst Fraenzke, Grobenzell, Germany, assignor to H. Schaefer KG, Munich, Germany
Filed Mar. 15, 1971, Ser. No. 124,294
Claims priority, application Germany, Sept. 21, 1970, P 20 46 485.1
Int. Cl. B65g *15/00*
U.S. Cl. 198—181 **9 Claims**



An endless conveyor of the luggage circulating type as used in airports and the like comprises an articulated series of luggage supporting plates which overlap each

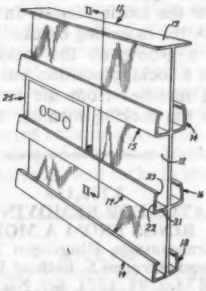
other roof shingle fashion and present a traveling platform which is transversely inclined for ready luggage pick-up and gap-free in the linear as well as in the curved stretches of the conveyor.

3,702,131
BELT TRACKING SYSTEM
David Roth Stokes, Webster, Salvatore Latone, Rochester, and William E. Jordan, Penfield, N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed Dec. 29, 1970, Ser. No. 102,311
Int. Cl. B65g *15/62*
U.S. Cl. 198—202 **8 Claims**



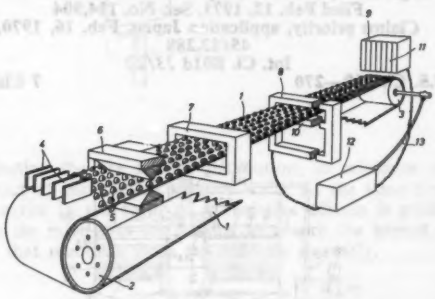
A belt tracking arrangement for use with a belt supporting roller in a belt assembly employing at least three rollers wherein the shaft for the roller is mounted for short pivotal movement about a control axis normal to its axis and which lies in a plane that bisects the angle of the belt runs on either side of the roller. The roller shaft is mounted between the legs of a yoke which has its axis of rotation in coincidence with the control axis.

3,702,132
CASSETTE CONTAINER
Larry L. Fites, Kalamazoo, and Kingsley M. Mann, Portage, Mich., and Karl A. Utrecht, Cincinnati, Ohio, assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Oct. 1, 1970, Ser. No. 77,268
Int. Cl. A45c *11/00;* **B65d** *81/00, 85/67*
U.S. Cl. 206—1 R **11 Claims**



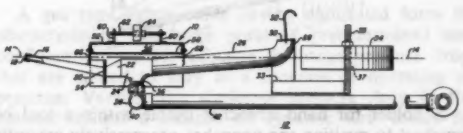
A device for holding relatively small and substantially flat articles, such as tape cassettes, said device preferably being formed from a substantially stiff but resiliently flexible plastic or metallic material. Said holding device has a flat and preferably rectangular main wall means and a plurality of shelf members having L-shaped cross sections and integral with said main wall means. Said shelf members are spaced from each other and are arranged for receiving and firmly holding an article, such as a tape cassette, with respect to the holding device. Handle means, top wall means and/or cover means may be provided.

3,702,133
PROCESS AND APPARATUS FOR MAGNETIC SEPARATION
Claude Jacques Vibert and Louis Jean Theodore Le Pape, Viviers, France, assignors to Societe Anonyme: Ciments Lafarge, Menier, and Etablissement Public: Agence Nationale de Valorisation de la Recherche (CANVAR), Paris, France
Filed Feb. 1, 1971, Ser. No. 111,576
Claims priority, application France, Feb. 6, 1970, 7004306
Int. Cl. B07c *5/344*
U.S. Cl. 209—81 A **9 Claims**



A method and apparatus for separating materials. The materials to be separated are loaded in parallel rows on a conveyor belt and pass by a demagnetising apparatus, a magnetising apparatus and then a sensor. An isolating apparatus is located downstream of the sensor to physically separate portions of the materials. Upon the detection of a magnetic field of a predetermined intensity the sensor produces a signal which is carried to the isolating apparatus via an amplifier and a delay device which compensate for the time taken for a portion of the materials to be conveyed from the sensor to the isolating apparatus. The sensor is preferably a differential induction device. The sensor may be rotary in which case it is useful for separating finely crushed or powdery materials.

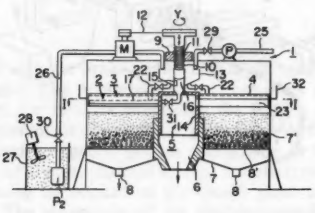
3,702,134
OVERFLOW-TYPE FLOATING SKIMMER
John L. Henning, Jr., and Warren J. Robicheaux, Port Arthur, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.
Filed Dec. 30, 1970, Ser. No. 102,798
Int. Cl. C02b *9/02*
U.S. Cl. 210—242 **12 Claims**



Apparatus for skimming oil from the surface of water in which oil overflowing a weir drains into an overflow

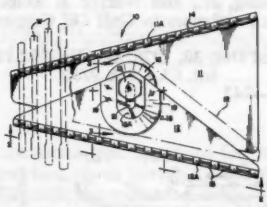
conduit joined to a counterbalancing duct. A float supports the juncture of the overflow conduit and counterbalancing duct at a substantially constant position relative to the liquid level. A drain line is connected to the counterbalancing arm whereby a difference in the rate at which liquid flows through the overflow conduit and the drain line causes a change in the liquid level in the counterbalancing duct. A change in volume of liquid in the counterbalancing arm rotates the overflow conduit to change the level of the weir and thereby adjust the flow through the overflow conduit to approximately that through the drain line. A float secured to the counterbalancing duct stabilizes operation of the apparatus.

3,702,135
FILTRATION APPARATUS FOR USE IN TREATING SLUDGE
Shiro Takahashi and Tadao Horiguchi, Yokohama, Japan, assignors to Kurita Water Industries Ltd., Higashe-ku, Osaka-shi, Japan
Filed Feb. 12, 1971, Ser. No. 114,904
Claims priority, application Japan, Feb. 16, 1970, 45/13,288
Int. Cl. B01d *23/20*
U.S. Cl. 210—270 **7 Claims**



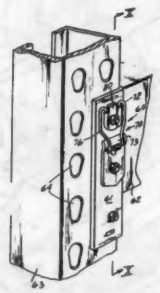
A method of treating sludge comprising the steps of dehydrating the sludge arising from the treatment of water, waste liquid, etc., by spreading it on a filter material and raking off the dehydrated sludge together with the surface layer of said filter material, and an apparatus pertaining to said method.

3,702,136
WRENCH HOLDER
Nathan E. Albertson, 221 Greenwood, Junction City, Oreg. 97448
Filed Mar. 3, 1971, Ser. No. 120,527
Int. Cl. B25h *3/04*
U.S. Cl. 211—60 T **2 Claims**



A holder for hand wrenches usable within a tool box or chest to position the wrenches progressively according to their size. The wrenches are held in place upon diverging supports having opposed recesses formed therein engageable with the tool adjacent the ends thereof. One form of the holder provides for both slidable and rotational movement between the supports to accommodate various wrench sizes.

3,702,137
LATCHING MECHANISM
Robert J. Evans, Aurora, Ill., assignor to Aurora Equipment Co., Aurora, Ill.
Continuation-in-part of application Ser. No. 849,427, Aug. 12, 1969. This application June 4, 1970, Ser. No. 43,514
Int. Cl. A47f *5/107*
U.S. Cl. 211—176 **15 Claims**

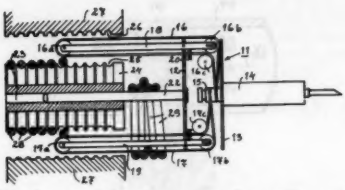


A latching mechanism adapted to adjustably and releasably connect two supporting members of a structure such as a pallet rack. The latching mechanism includes one structural member having headed connecting elements spaced therealong and another structural member having spaced slots or apertures having a wide portion for receiving the headed connecting element and a narrow portion preventing the removal of the connecting element once they are inserted therein. To prevent the accidental disengagement of the headed connecting element from the slot, a safety locking means is provided and comprises a locking finger or projection of a locking member which is mounted by a bracket for movement into and out of a position with the locking finger or projection extending into the wide portion of one of the slots to prevent movement of the connecting elements into that portion. To prevent accidental movement of the locking member, two embodiments of the device provide an irregular cross-section to form a cam portion engaged by a resilient portion of the mounting bracket which portions coact with each other to oppose movement of the locking member to withdraw the locking finger. In the other embodiment illustrated, the mounting bracket has a detent which is received in a groove on the locking member when the finger is in a locking position but during movement of the locking member from the locking position, the detent engages the locking member to oppose rotation thereof.

3,702,138
APPARATUS FOR REMOVING RUBBER RINGS FROM A MOLD
Set Ingvar Abrahamsson, Ringvagen 16, and Per Helge Perssons, Fanestadsvagen 6, both of Forsheda, Sweden
Filed Mar. 31, 1971, Ser. No. 141,924
Claims priority, application Sweden, Mar. 31, 1970, 4,327/70
Int. Cl. B29h *7/00*
U.S. Cl. 214—1 R **6 Claims**

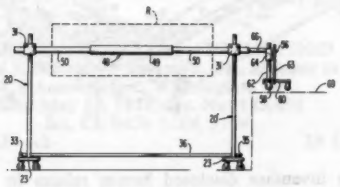
An arrangement for removing rubber rings from semicircular grooves machined in the outside surface of a mold core. After the rings are molded in the grooves

and the mold opened, a ring removal mechanism is advanced towards the core for dislodging and removing each ring from the position in which it was molded in a core groove. The mechanism includes a base supporting a motor which drives a pair of endless rubber belts respectively mounted on arms located on opposite sides



of the core. As the mechanism is moved inwardly into a ring engaging position, the motor driven belts contact each ring sequentially and because of the friction established between the linearly moving belt and each ring the ring is caused to be rolled out of its groove and onto a stationary bar for subsequent removal from the mold apparatus.

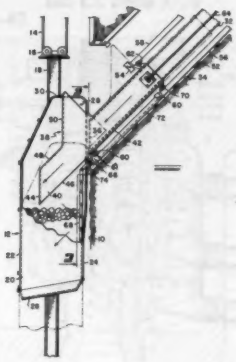
3,702,139
APPARATUS FOR HANDLING CARPET ROLLS
Chester C. Chaffin, 527 S. 4th W., Missoula, Mont. 59801
Filed Oct. 5, 1971, Ser. No. 186,712
Int. Cl. B60p *1/64*
U.S. Cl. 214—38 C **11 Claims**



An apparatus for lifting, transporting and racking heavy rolls of carpet embodies a pair of cooperating mobile jack units with extra height extensions, a third foreshortened mobile jack, a pair of carpet roll stands and an extension pole which receives the core of the carpet roll directly. The apparatus components coact to facilitate the lifting and moving of carpet rolls in stores and warehouses, the loading and unloading of rolls from trucks and the placement of rolls on elevated wall racks in stores.

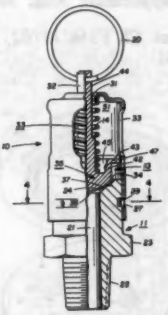
3,702,140
MINE SKIP LOADING APPARATUS
William M. O'Connor, Westport, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Feb. 22, 1971, Ser. No. 117,636
Int. Cl. B65g *11/14*
U.S. Cl. 214—622 **9 Claims**

The disclosure illustrates apparatus for loading ore into a cable-supported ore-carrying mine skip. A deflector assembly is telescoped over the end of a chute containing ore to be loaded into the mine skip. The deflector assembly is displaceable from a position where it blocks flow of ore from the chute to a loading position wherein it projects into the path of travel of the mine skip. It then permits flow of ore into the skip while at the same time



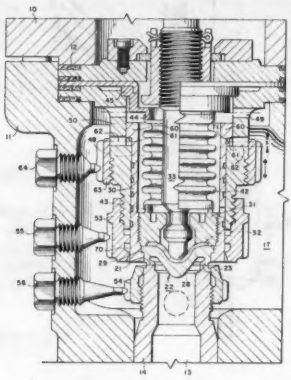
deflecting the ore toward the bottom to minimize the impact of material on the side walls. At the same time, a barrier in the form of a chainlike curtain is guided into the mine skip for loading to absorb the impact of ore that rebounds from the deflector assembly.

3,702,141
GAS TYPE SAFETY VALVE
Richard H. Wetterhorn, Fairfield, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Feb. 22, 1971, Ser. No. 117,480
Int. Cl. F16k *17/30*
U.S. Cl. 137—469 **14 Claims**



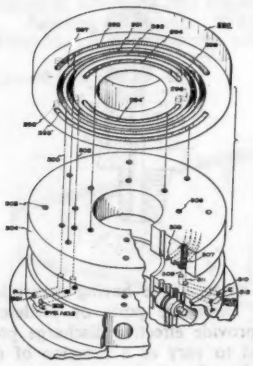
A gas type safety valve having controlled force lift characteristics. Discharge ports of predetermined area configuration provide effective discharge pressure drops that are caused to vary as a function of operating set pressure. Varying the discharge pressure drop in this manner utilizes a balance of dynamic flow forces for achieving a pressure controlled blowdown. Operative pressure ranges of individual spring components previously characterized by limited range suitability are thereby extended over a wide range of set pressures and spring rates.

3,702,142
SAFETY VALVE HAVING BACK PRESSURE COMPENSATOR
John W. Richardson, Colfax, La., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed July 27, 1970, Ser. No. 59,782
Int. Cl. F16k *17/04*
U.S. Cl. 137—472 14 Claims



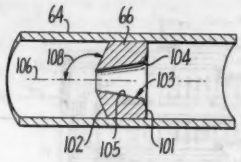
A safety valve capable of offsettably compensating the adverse operating effects of back pressure associated with valve installation. At full lift, a controlled annular venting about the raised valve disc provides an upward thrust of effective magnitude greater than the downward force being exerted by back pressure. The degree of offset compensation is adjustable to suit operating conditions.

3,702,143
KIDNEY VALVE FOR FLUID MOTOR AND OTHER USES
Norman L. Van Wagenen, 378 E. Truman Ave., Salt Lake City, Utah 84115, and Ara Norman Lamph, 540 North 200 East, Bountiful, Utah 84010
Continuation-in-part of abandoned application Ser. No. 740,414, May 23, 1968, which is a division of application Ser. No. 607,428, Jan. 5, 1967, now Patent No. 3,420,059. This application Aug. 30, 1971, Ser. No. 175,853
Int. Cl. F16k *11/02*
U.S. Cl. 137—625.21 13 Claims



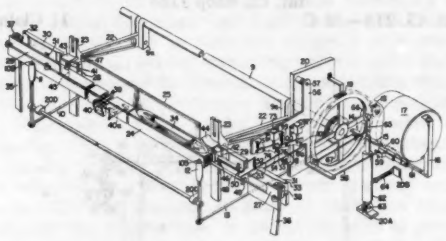
A fluid control system comprising a kidney valve formed with a pair of concentric recesses and a plurality of semicircular recesses disposed in opposing relation and connected to respective ones of said circular recessses. Two forms of said valve are disclosed.

3,702,144
ORIFICE STRUCTURE HAVING TWO DIFFERENT FLOW RATES
Malcolm W. Loveland, Orinda, Calif., assignor to Atlas Pacific Engineering Company
Filed Oct. 6, 1970, Ser. No. 78,502
Int. Cl. F15d *1/02*
U.S. Cl. 138—44 1 Claim



This invention relates to a novel form of orifice structure providing a high rate of flow in one direction and a reduced rate of flow in the opposite direction under the same conditions.

3,702,145
PROTECTION AND CONTROL MEANS FOR FLY-SHUTTLE LOOMS
Edgar P. Turner, Watchung, N.J., assignor to North American Rockwell Corporation, Pittsburgh, Pa.
Original application Nov. 19, 1965, Ser. No. 508,745, now Patent No. 3,626,992, dated Dec. 14, 1971. Divided and this application July 20, 1971, Ser. No. 164,387
Int. Cl. D03d *51/00*
U.S. Cl. 139—336 10 Claims



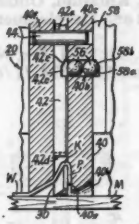
The invention disclosed herein relates in general to improvements in automatic and manual stopping of fly-shuttle looms. The invention discloses a mechanical means for detecting late shuttle arrival at the throat of the receiving box and associated linkage for quickly stopping the loom shocklessly. This system is operated by the linkage automatically tripping a quick-disconnect element unless a sensor in the path of the fly shuttle is displaced at the proper time. It also discloses linkage associated with a standard filler break detector of the same type as and in combination with the late shuttle detection system, to quickly and shocklessly stop the loom upon thread breakage. Also disclosed is a hydraulic and spring-operated energy absorption apparatus to aid the loom's normal braking system when a stop is desired. By means of a novel linkage, this apparatus is caused to engage the loom's flywheel upon either a manual or automatic stop signal being given. Additionally, the disclosure teaches a system for insuring that on manual stops the loom will always stop at the same position in its cycle. This system is disclosed as either using the linkage of the first two stopping means or a similar system. There is also disclosed an electrical system for providing controlled loom stoppage in the event of an electrical power failure.

3,702,146

PRONG FORMING AND DRIVING MECHANISM

Leroy M. Varga, Dover, and Thomas L. Voorhees, Morris Plains, N.J., assignors to Rockaway Corporation, Rockaway, N.J.

Filed May 17, 1971, Ser. No. 143,760
Int. Cl. B21f 45/00
U.S. Cl. 140—93 C 6 Claims



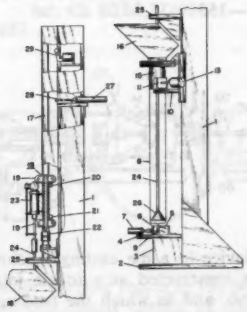
Prong forming and driving mechanism for particular use in a machine for forming loop fasteners on wire-bound containers, having a loop bar with a hook-like extension at its lower end, a former bar for engaging the end portion of a binding wire projecting beyond the hook-like extension and bending it downwardly to form a prong which is supported on its inside by the hook-like extension and on the other three sides by the walls of a groove in the former bar, and a driver bar which drives the prong through the face material of a box blank while camming the hook-like extension progressively out of the way, with latching means for automatically latching and unlatching the former bar to the driver bar at appropriate stages of the cycle, so that the entire mechanism can be driven by a single vertically reciprocable crossbar in a conventional loop fastener machine.

3,702,147

PACKING APPARATUS AND METHOD

Frank E. Slawinski, Tamaqua, Pa., assignor to ICI America Inc., Wilmington, Del.

Filed May 14, 1971, Ser. No. 143,490
Int. Cl. B65b 1/04, 3/04
U.S. Cl. 141—12 18 Claims



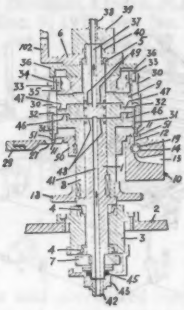
An apparatus for packing a material in an upright container. A vibrating tamp stick is mounted on a carriage which can move in opposition to the container against a uniform force. As the tamp stick vibrates, material flows around its tip and is packed by it, forcing the carriage and the container to gradually separate until the container is completely packed.

3,702,148

MACHINE FOR THE DEPOSITION OF MEASURED AMOUNTS OF SOFTENED THERMOPLASTIC MATERIAL INTO CLOSURE CAPS

Ettore Busi, 191 Via Selice, Imola, Italy

Filed Sept. 9, 1970, Ser. No. 70,719
Claims priority, application Italy, Sept. 16, 1969, 7,317/69
Int. Cl. B65b 3/10
U.S. Cl. 141—67 7 Claims



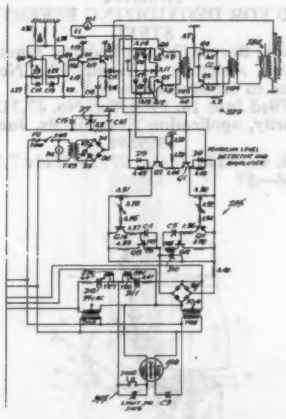
This invention relates to a machine for depositing measured amounts of softened thermoplastic materials into closure caps to provide linings in the caps. This machine includes a metering and a delivering device for viscous or softened plastics lumps, and a suction gripper mounted for cyclic movement along a closed path and arranged for connection to a vacuum pipe for reception of one of the plastics lumps delivered by said metering device and for subsequent connection to a blast air pipe for discharging the plastics lump into a closure cap.

3,702,149

LANE RESURFACE LEVEL CONTROL INCLUDING A VARIABLE DEADBAND MOTOR CONTROL

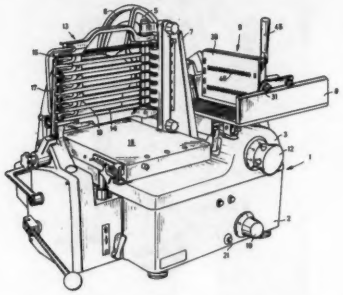
Robert C. Thompson, Muskegon, Mich., assignor to Brunswick Corporation

Filed Dec. 23, 1969, Ser. No. 887,554
Int. Cl. B27c 1/02
U.S. Cl. 144—117 C 4 Claims



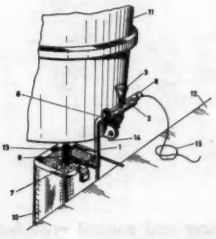
A lane resurfacer and control provided with circuitry for driving the lane resurfacer down the lane from the foul line provided with automatic controls for maintaining the proper cutter level during the forward travel of the lane resurfacer toward the pit having a variable deadband circuit for minimizing hunting.

3,702,150
SLICING MACHINE AND CLAMPING DEVICE THEREFOR
Ernst Müller and Albrecht Maurer, Balingen, Germany, assignors to Bizerba-Werke Wilhelm Kraut KG, Balingen, Wurttemberg, Germany
Filed Dec. 14, 1970, Ser. No. 97,920
Claims priority, application Germany, Dec. 13, 1969, P 19 62 666.5
Int. Cl. B26d *4/00*
U.S. Cl. 146—102 R 2 Claims



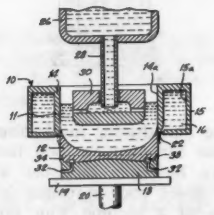
A slicing machine has a rotating circular blade mounted on a machine housing. Carriage means are mounted on the machine housing for holding a material to be sliced adjacent the blade and for reciprocating movement in a direction parallel to the plane of the blade. A clamping device is mounted on the carriage means for holding a material to be sliced. This clamping means has a pivotally mounted holder provided with gripper pins arranged on a side facing the carriage to selectively hold long pieces of material to be sliced, and has a plurality of gripper hooks retractably mounted on a side of the holder facing the plane of the blade to selectively hold short pieces of materials to be sliced. When long pieces are held, the holder rests on top of the piece of material to be sliced, and when short pieces of material are held the holder rests flush against the carriage and abuts an end surface of the material.

3,702,151
METHOD FOR DEOXIDIZING EFFERVESCENT STEEL
Jan F. de Blok, Beverwijk, and Leonard Jansse, Ijmuiden, Netherlands, assignors to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N.V.
Filed June 18, 1970, Ser. No. 47,313
Claims priority, application Netherlands, June 23, 1969, 6909598
Int. Cl. B22d *27/18, 27/20;* C21c *7/06*
U.S. Cl. 164—57 4 Claims



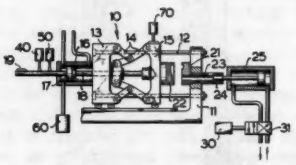
A method for deoxidizing effervescent steel, in which a deoxidizing powder such as aluminum is injected into the casting stream from a ladle into a casting mold. The grain size of the powder is mainly between 40 and 200 microns and the powder is uniformly supplied to the casting stream during at least 70% of the time for filling the mold. In the device there is a cooling jacket around the discharge end for the powder. The powder is blown by air in a metered quantity.

3,702,152
PROCEDURES AND APPARATUS FOR CONTINUOUS CASTING OF METAL INGOTS
Neil Burton Bryson, Kingston, Ontario, Canada, assignor to Alcan Research and Development Limited, Montreal, Quebec, Canada
Filed Mar. 22, 1971, Ser. No. 126,532
Int. Cl. B22d *11/00*
U.S. Cl. 164—89 6 Claims



In continuous casting of metal ingots by delivering molten metal to an open-ended mold while withdrawing cast ingot continuously from the open mold end and while directing liquid coolant onto the ingot surface emerging from the mold, the extremity of the ingot is supported by a stool that initially closes the mold open end and moves progressively away from the mold as the ingot is cast. The stool is provided with plural drainage passages loosely closed with plugs positioned to be frozen into the butt of the ingot. Contraction of the solidifying butt pulls the plugs out of the drainage passages sufficiently to permit discharge through the passages of fluid collecting between the ingot butt and the stool.

3,702,153
SAFETY DEVICE FOR DIE CASTING MACHINES
Rolf Frey, Winterbach, Germany, assignor to Mahle-Werk G.m.b.H., Fellbach, Germany
Filed July 6, 1971, Ser. No. 159,995
Int. Cl. B22c *19/04;* B22d *17/32*
U.S. Cl. 164—153 1 Claim



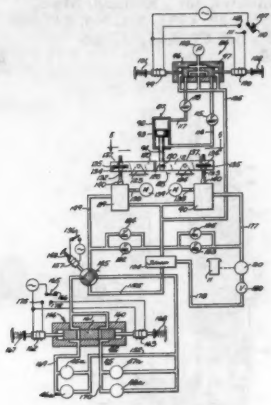
A safety device in a die casting machine has a mold-holding press constructed as a toggle joint press with a hydraulic drive, and in which the feeding of the casting material from the pressure chamber into the mold cavity is initiated by an electric switch element. In the control circuit of the switch element various switches, responding to the position of the hydraulic drive or to a minimum pressure prevailing therein, are arranged in series in such a way that the switch element that initiates the casting process responds only when the drive system has assumed its position of closure and the two mold halves are firmly pressed against each other.

3,702,154

CONTINUOUS CASTING MACHINE RECIPROCATION AND WITHDRAWAL CONTROL SYSTEM

Joseph Rokop and Geoffrey W. Hughes, Bethel Park, Pa., assignors to Pennsylvania Engineering Corporation

Filed Sept. 3, 1970, Ser. No. 69,361
Int. Cl. B22d *11/12, 17/32*
U.S. Cl. 164—154 9 Claims



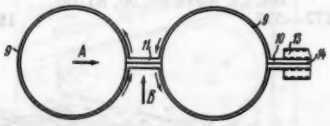
A continuous casting machine having a flow through mold, hydraulically driven withdrawal rollers for withdrawing a molded strand from the mold, and hydraulically tion parallel with that of strand withdrawal to insure separation of the strand therefrom during withdrawal. The withdrawal speed is selectively adjustable to correspond to the metal pouring rate and control means effects simultaneous changes in the speed of the oscillating mechanism according to a preselected proportionally constant.

3,702,155

APPARATUS FOR SHAPING INGOTS DURING CONTINUOUS AND SEMI-CONTINUOUS CASTING OF METALS

Zinovy Naumovich Getselev, Kuibyshev, U.S.S.R., assignor to Kuibyshevsky Metallurgchesky zavod im. V.I. Lenina, Kuibyshev, U.S.S.R.

Filed Dec. 9, 1970, Ser. No. 96,525
Int. Cl. B22d *27/02*
U.S. Cl. 164—251 4 Claims



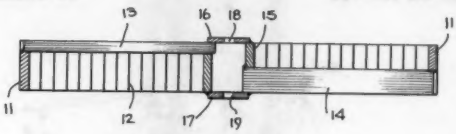
An apparatus for shaping ingots in the process of continuous and semi-continuous casting of metals provided with a device for feeding a molten metal onto a dummy bar in each of the arrangements which includes a cooled inductor for shaping a liquid portion of the ingot and a collector with a shield for cooling liquids directed onto the side surfaces of the ingot being shaped. The inductors of the above-mentioned arrangements are connected in series through jumpers, each of which is made of two bars insulated one from another, in which case these jumpers and current-carrying bars are inclined downwards from the inductors. The latter are made smoothly decreasing in height in the direction of each jumper and current-carrying bar.

3,702,156

AIR-TO-AIR ENERGY EXCHANGE WHEEL AND METHOD OF FABRICATION

Marvin K. Rohrs, Fanwood, and Robert J. Neary, Westfield, N.J., assignors to Aero-Flow Dynamics, Inc. (The Wing Company Division), Linden, N.J.

Filed Dec. 3, 1970, Ser. No. 94,910
Int. Cl. F28d *19/04*
U.S. Cl. 165—10 15 Claims



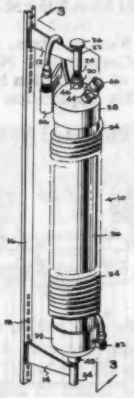
Alternating flat and corrugated ribbons of metal or other foil are wrapped continuously in a spiral around a central hub. When the appropriate diameter is attained the outer periphery is secured by a rim having an axial dimension equal to the axial dimension of the spiral wrapping. Angularly spaced metal spokes are inset in grooves in opposite faces of the wheel flush with such faces. The spokes on one side of the wheel are of substantial axial dimension for structural strength and are secured both to the rim and to the hub. Thinner spokes located on the opposite face of the wheel are generally permitted to float at one or both ends, although under certain circumstances both ends may be secured.

3,702,157

FIRE EXTINGUISHER

Walter C. Thomas, P.O. Box 22, Rte. 3, Fort Myers, Fla. 33901

Filed Sept. 20, 1971, Ser. No. 181,889
Int. Cl. A62c
U.S. Cl. 169—1 R 10 Claims



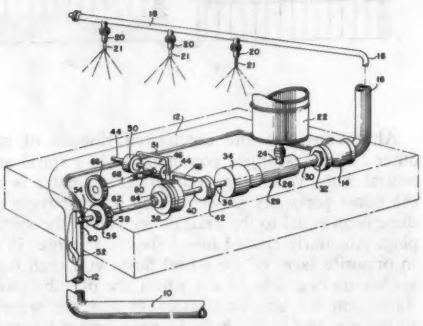
A fire extinguisher having a polyvinyl pipe closed on each end by polyvinyl caps and pressurized with gas and dry fire extinguisher material on its interior and having a dispensing hose connected to one end and coiled about the pipe with the pipe being supported by spring biased

detent means and a fixed detent means respectively received in axially aligned recesses in each end of the extinguisher for supporting the extinguisher but permitting reel-like rotation of the extinguisher as the hose is removed or for permitting easy manual removal of the entire extinguisher from the supporting means.

3,702,158
FIXED FIRE EXTINGUISHING SYSTEM USING DELAYED ADDITIVE INJECTION

William L. Livingston, Sharon, Mass., and Carl Marshall Munson, North Scituate, R.I., assignors to Factory Mutual Research Corporation, Norwood, Mass.

Filed June 1, 1971, Ser. No. 148,778
Int. Cl. A62c *35/00*
U.S. Cl. 169—15 **10 Claims**

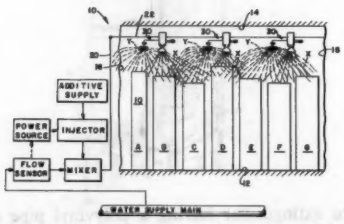


A fixed fire extinguishing system in which one or more discharge heads are adapted to be actuated in response to a fire condition to disperse a fluid supplied thereto by a fluid flow line. After a predetermined amount of fluid is discharged through the heads, an injector introduces an additive to the line in proportion to the fluid flow through the line to improve the fire fighting characteristics of the fluid.

3,702,159
FIRE PROTECTION SYSTEM UTILIZING DIRECT DISCHARGE NOZZLES AND FILL-IN SPRINKLER HEADS

William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.

Continuation-in-part of application Ser. No. 148,480, June 1, 1971. This application Oct. 19, 1971, Ser. No. 190,552
Int. Cl. A62c *35/00*
U.S. Cl. 169—5 **40 Claims**

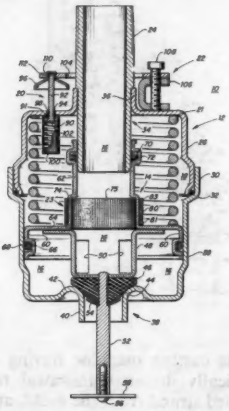


A fire protection system for buildings and the like wherein a plurality of extinguishant discharge heads are mounted in the building and are connected to a source of extinguishant. Each head has a direct discharge nozzle and a sprinkler head for discharging a continuous supply of extinguishant across the area to be protected.

3,702,160
SUPPRESSOR DEVICE FOR AUTOMATIC ON-OFF SPRINKLER HEAD

Wilfred J. Grenier, Rutland, Mass., assignor to General Industries, Inc., Rutland, Mass.

Filed May 28, 1971, Ser. No. 147,869
Int. Cl. A62c *37/06*
U.S. Cl. 169—20 **24 Claims**



A suppressor device for a sprinkler head having a control chamber and a primary chamber interconnected by a passage including a unidirectional valve member for permitting flow through the passage from the primary chamber to the control chamber when the pressure in the primary chamber exceeds that in the control chamber and preventing flow in the other direction through the passage from the control chamber to the primary chamber when the pressure in the control chamber exceeds that in the primary chamber.

3,702,161
WING LIFT LINKAGE

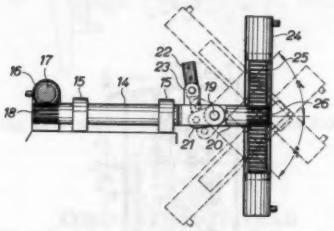
Ralph K. Zachary and John F. Luoma, Lisbon, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed June 29, 1971, Ser. No. 157,978
Int. Cl. A01b *49/00, 63/00*
U.S. Cl. 172—311 **18 Claims**

A multi-section implement having an improved lift mechanism for raising at least one of said sections from a lowered field position to a raised transport position, said improved lift mechanism including a bellcrank pivotally secured to said section to be raised, means for guiding

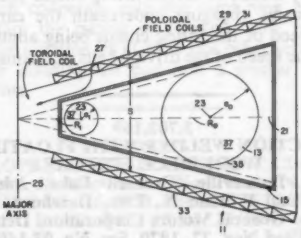
one end of said bellcrank for predetermined movement, and actuating means connected with a second end of said bellcrank for moving said bellcrank and thereby raising said section to be raised, whereby a mechanical advantage is realized in terms of force necessary to raise said section and movement of said actuating means.

3,702,162
ADJUSTABLE SUPPORT FOR RING DRILLING
Teuvo Gronfors, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland
Filed Dec. 15, 1970, Ser. No. 98,380
Claims priority, application Finland, Oct. 19, 1970, 2,811
Int. Cl. E21c *11/02*
U.S. Cl. 173—43 **3 Claims**



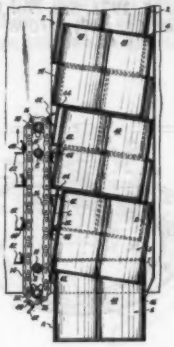
The present invention concerns a ring drilling device adapted for operating in a tunnel and comprising a boom rotating about its longitudinal axis and to which is attached a cradle transverse thereto for the feeding device for the rock drill. On the rotatable boom, there is mounted a boom head turnable about an axis perpendicular to said boom, the cradle being mounted on this turnable boom head to be rotatable about is longitudinal axis.

3,702,163
DEVICE FOR COMPRESSION HEATING OF TOKAMAK DISCHARGES
Harold P. Furth and Shoichi Yoshikawa, Princeton, N.J., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Apr. 15, 1970, Ser. No. 28,890
Int. Cl. G21b *1/00*
U.S. Cl. 176—3 **6 Claims**



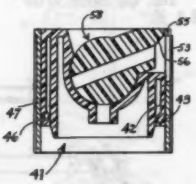
An apparatus is disclosed for heating and compressing a toroidal plasma column. The apparatus comprises a toroidal evacuated container, having annular toroidal and poloidal coils centered on the major axis. Interacting fields produce an inward compression of the plasma column toward the major axis characterized by a reduction in the major and minor radii of the plasma column.

3,702,164
CHAIN CONTROLLED VENDER FOR STACKED ARTICLES
Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Charles Town, W. Va.
Filed Mar. 18, 1971, Ser. No. 125,728
Int. Cl. B65h *3/30*
U.S. Cl. 221—77 **8 Claims**



A pair of open-bottom guide channels in a cabinet hold adjacent columns of articles, the channels being dimensioned so the articles can tilt in one direction therein. Endless chains extend along only the bottom portions of the channels and have lugs engaging one bottom edge of only the lowermost article in each column, supporting the entire column by that one article, with all articles tilted. As the chains are actuated the columns are lowered until the bottom article is discharged and the column drops onto the next lug. The lugs on the two chains are vertically staggered to discharge articles from one column then the other, alternately. The endless chain assemblies are removable as a unit from the cabinet, for service or repair.

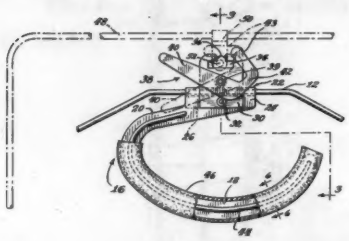
3,702,165
CHILD-PROOF DISPENSING CLOSURES
Robert N. Carow, Barrington, and Sidney M. Libit, Glencoe, Ill., assignors to U.S. Cap & Closure Inc., Chicago, Ill.
Filed July 28, 1971, Ser. No. 166,838
Int. Cl. B65d *55/02*
U.S. Cl. 222—153 **17 Claims**



Dispensing closures of the class which include a spout rotatably engaged in a base and movable between open and closed positions. To render the closure proof against being opened by a child of tender years, the closure, in one aspect, is provided with a disc surmounting the spout and adapted to be rotated to position a slot in the disc in or out of register with the spout. When the disc is rotated into register, the spout can be swivelled to dispensing position and vice versa. In another aspect, the disc has a notch into which the spout may be introduced to lock the

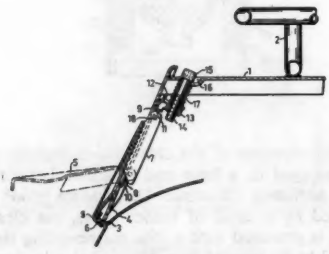
disc against rotation. In yet another aspect, the spout is rendered inaccessible unless a spout-lifting finger on a rotatable sleeve is moved into alignment with the spout.

3,702,166
GARMENT HANGER
Max L. Jaffe, Glencoe, Ill.
(1240 N. Homan Ave., Chicago, Ill. 60647)
Filed Jan. 21, 1971, Ser. No. 108,357
Int. Cl. A47j *51/098*
U.S. Cl. 223—85 **1 Claim**



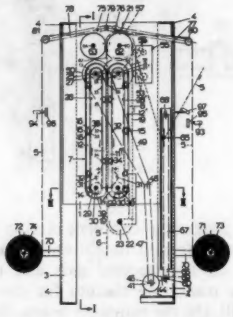
A garment hanger provided with a top horizontal portion and a handle which is manually rotatable about the longitudinal axis of the top horizontal portion. Said handle supports a latching plate and a latching arm whereby the hanger may be detachably secured to a support member in a suitcase or the like when the handle is rotated to position the latching plate and latching arm above the garment hanger. The handle may be rotated about the longitudinal axis of the top horizontal portion of the garment hanger to position the handle above the top of the garment hanger so that it may be readily carried or may be supported in a garment carrying bag. The handle is shaped to provide a large arc or a large radius so that the four fingers of a person's hand can engage same and be curled around it to provide a firm and convenient hand support.

3,702,167
ATTACHMENT FOR FASTENING A LUGGAGE RACK INTO THE DRIP MOULDING OF AN AUTOMOBILE
Lars-Olov Roland Olson, Trollhattan, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden
Filed Jan. 18, 1971, Ser. No. 107,280
Claims priority, application Sweden, Jan. 23, 1970, 842/70
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 E **3 Claims**



The present invention relates to an attachment for fastening a luggage rack in the drip moulding of an automobile. The attachment is designed to be easily set on and removed, and the risk of it losing its grip around the drip moulding is lessened. To this end, the attachment has a clamp provided with a locking hook arranged to co-operate with an upright slide in communication with a support. The slide is tightenable in a direction upwards away from the drip moulding in engagement with the locking hook so that the support and the clamp are squeezed firmly like tongs around the drip moulding.

3,702,168
CONTINUOUS WEB FEEDING APPARATUS
Dirk Godfried Johannes Roos, Amsterdam, Netherlands, assignor to Trans-Atlas A.G., Amsterdam, Netherlands
Filed Feb. 16, 1971, Ser. No. 115,351
Claims priority, application Netherlands, Feb. 16, 1970, 7002157
Int. Cl. B65h *17/34*
U.S. Cl. 226—110 **9 Claims**

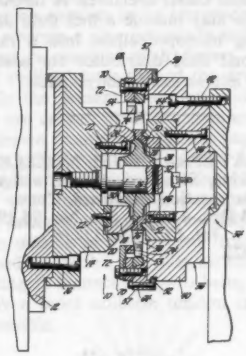


A machine for making sacks from a double layer web of thermoplastic sheet material by heat sealing and cutting in which the web is fed with continuous movement through the machine by being clamped at regular and adjustable intervals between pairs of driven carrier members extending transversely of the web and containing the web sealing and cutting means. The carrier members are moved around through two closed guide tracks, one on each side of the web travel path, having vertically downwardly extending leading track portions through which the paired web-engaging carrier members are moved downwardly by driving belts or chains clamped between the carrier pairs, and having vertically upwardly extending return track portions through which the carrier members are moved upwardly by means of driven lifting chains provided with projecting cams engaging underneath the carrier members, the speed of the lifting chains being adjustable with respect to the speed of the driving belts or chains.

3,702,169
FRICTION WELDER WITH FLOATING WORKPIECE FIXTURE
Gerald D. Bonneville, Orchard Lake, Adolf Hetke, Livonia, and William N. Free, Dearborn, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 27, 1970, Ser. No. 93,140
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **4 Claims**

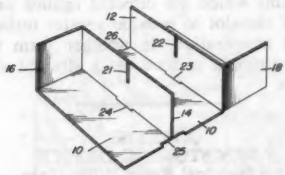
The friction welder has a floating shroud in the tail stock that provides radial support of a workpiece having thin or fragile portions. There is limited shroud rotation relative to the tail stock during the welding process so that torsional forces generated during friction welding will not be transmitted from the workpieces through the shroud to the tail stock. This allows the workpieces to be

joined without destruction or damage by the friction welding process. The shroud has a plurality of segments



facilitating easy removal of the workpieces from the tail stock.

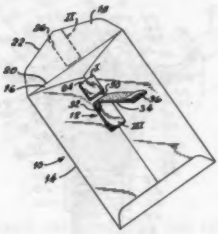
3,702,170
COMPARTMENTED PAD
William S. Adams, Runnemede, N.J., assignor to Westvaco Corporation, New York, N.Y.
Filed July 29, 1970, Ser. No. 59,214
Int. Cl. B65d *5/48*
U.S. Cl. 229—15 **9 Claims**



A compartmented pad structure is constructed from a blank of paperboard or the like which is cut and scored to provide a pair of longitudinal partition panels that are foldable upwardly from the edges of the blank into parallel spaced relation. The partition panels include means which cooperate with the remaining blank structure to retain the panels in position, and, provision is made for the addition of at least one other separate panel element for dividing the pad into a greater number of compartments.

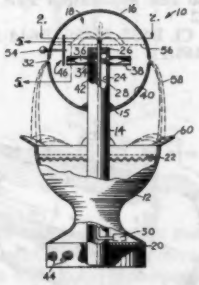
3,702,171
ENVELOPE WITH IMPERMANENT CLOSURE
Elliot Levine, 50 Morton St., New York, N.Y. 10014
Filed July 16, 1971, Ser. No. 163,269
Int. Cl. B65d *27/06, 27/16*
U.S. Cl. 229—79 **8 Claims**

An envelope having a pressure-sensitive tape-type impermanent closure consisting of three tape strips. Each tape strip has an aggressively adhesive side and a low adhesion side. A first and a third of said tape strips are adhered by their aggressively pressure-sensitive adhesive sides to the rear surface of the envelope body in alignment. The first of the tape strips is located under the flap when the flap is closed and runs perpendicular to the hinge connecting the flap to the envelope body, terminating at the position occupied by the free edge of the flap when the flap is closed. The third of the tape strips is located on the rear surface of the envelope body and extends away from the edge of the first strip remote from the flap hinge. The third tape strip has a portion extending from remote edge of the first strip. This portion is not adhesively secured to the back of the envelope body and is referred to as the "free" portion. When the envelope is sold the free portion of the third tape strip is adhesively secured to the low adhesion side of the first strip. A second tape strip which has its aggressively pres-



sure-sensitive adhesive side adhered to the back of the flap is provided. The second strip is in alignment with the said first and third tape strips and may be slightly wider. In use the free portion of the third tape strip is peeled from the low adhesion side of the first strip, then the flap is folded to closed position and finally the free portion is adhered to the low adhesion side of the second strip from which it can be readily peeled at any time that the contents of the envelope are to be inspected. The tip of the free portion has a pull tab thereon neither side of which has a pressure-sensitive adhesive thereon.

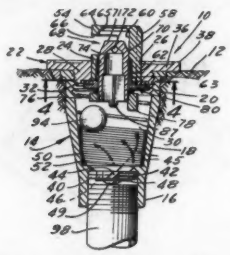
3,702,172
LIGHT FOUNTAIN
Dale E. Hawkins, 15513 E. 43rd, Independence, Mo. 64055
Filed Sept. 20, 1971, Ser. No. 181,794
Int. Cl. F21p *7/00*
U.S. Cl. 239—18 **13 Claims**



An illuminated, decorative water fountain presenting an attractive visual effect of light cascading from an elevated container of water. The interior of the container is filled with water to an operating level above apertures in the container to present a free flow, cascading discharge of water along an exterior path. A separate light source for each aperture is disposed within the interior of the container to direct light toward the associated

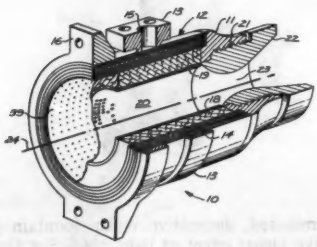
aperture at an angle relative to the exterior path in such a manner that the water discharge effects deflection of the light along the exterior path to create a visual appearance of cascading light.

3,702,173
SPRINKLER HEAD
Elmer N. Reynolds, 15915 Arbela Drive, Whittier, Calif. 90603
Filed Feb. 19, 1971, Ser. No. 116,863
Int. Cl. B05b *15/10*
U.S. Cl. 239—204 **6 Claims**



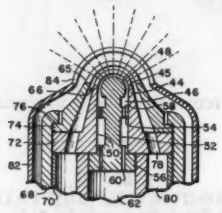
A sprinkler head comprising a main body housing, having a threaded cap member secured to the upper end thereof, adapted with an opening therein to receive a sleeve member which is slidably disposed within the opening, and a core assembly being adapted to be rotatably secured within the sleeve member, the core assembly being provided with a frictional clutch assembly which includes a plurality of slip rings, a spring and a lock ring when axially aligned within the sleeve member, allowing the core or nozzle member to rotate by means of a ball striking a base portion of the core assembly.

3,702,174
FLUID DISTRIBUTORS AND THRUSTERS
Ronald A. Hankins and Donald W. Culver, Fair Oaks, and Harrison B. Scammon, Jr., Carmichael, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.
Original application Oct. 13, 1969, Ser. No. 865,706. Divided and this application Feb. 18, 1971, Ser. No. 116,402
Int. Cl. B63h *11/00;* **B64d** *33/04*
U.S. Cl. 239—265.11 **7 Claims**



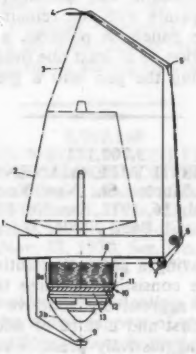
According to the present disclosure, a fluid distributor comprises a stack of a plurality of wafers. Inlet apertures are provided through inlet wafers and are in fluid communication with distribution apertures in a distribution wafer. Outlet apertures are provided in fluid communication with the distribution wafers. Preferably, metering apertures and transfer apertures are provided in serial fluid communication with said distribution apertures between the inlet and outlet apertures. A thruster according to this disclosure may include a first fluid distributor for radially injecting monopropellant into a radial catalyst pack, or a second fluid distributor for axially injecting monopropellant into an axial catalyst pack.

3,702,175
FLAT SPRAY FUEL NOZZLE
Sidney C. Watkins, Stratford, Conn., assignor to Avco Corporation, Stratford, Conn.
Filed Dec. 4, 1970, Ser. No. 95,193
Int. Cl. F23d *11/16*
U.S. Cl. 239—422 **4 Claims**



The disclosure illustrates a flat spray fuel nozzle comprising, in one form, a spherical chamber having an elongated outlet slot and a sphere in the chamber closely adjacent the slot. Fuel flow through the chamber is divided into two streams which are directed against one another at the inlet of the slot to provide greater turbulence and more efficient atomization. In another form the nozzle uses a bar positioned in front of a straight slot for dividing the flow.

3,702,176
YARN STORING DEVICE
Karl Isac Joel Rosen, Villa Haga, S–52300 Ulrichehamn, Sweden
Filed Jan. 13, 1971, Ser. No. 106,044
Int. Cl. B65h *51/20*
U.S. Cl. 242—47.01 **4 Claims**



Retarding ring for a yarn storage device. An improved retarding ring is provided for a presently known yarn

storage device wherein yarn from a source is moved tangentially onto a storage drum and is then drawn axially from the drum. Means are provided on the discharge portion of said drum for retarding the withdrawal of said yarn and thereby providing tension thereon. The present invention consists in an improvement in such retarding ring wherein a ring surrounds and is spaced from the drum and is provided with fingers projecting from the ring and inclined both toward the drum and circumferentially. In the present invention said fingers in one embodiment are curved in such a manner that when the ring is withdrawn from the drum the fingers project into an imaginary cylinder concentric with the ring of a diameter equal to the diameter of the drum. In another embodiment said fingers similarly project into such an imaginary cylinder but then are reversely curved so that their tips are outside of and spaced from such cylinder. In both embodiments this provides an increased zone by which such fingers contact the yarn being withdrawn and thereby apply a more uniform tension thereto than was previously possible.

3,702,177

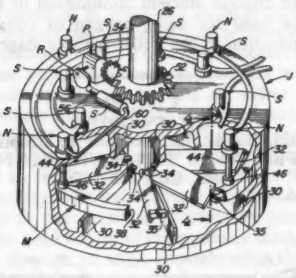
ADJUSTABLE ROTARY HYDRAULIC BRAKE

Ignatius John Niemkiewicz, Wilmington, Del., and George H. Reinemuth and Floyd G. Silver, Secane, Pa., assignors to Gulf + Western Industrial Products Company, Grand Rapids, Mich.

Continuation of abandoned application Ser. No. 834,660, June 19, 1969. This application Mar. 15, 1971, Ser. No. 124,518

Int. Cl. B64f *1/02*

U.S. Cl. 244—110 A **4 Claims**



A rotary hydraulic brake includes a rotor having rotor vanes and a stator having stator pockets. Liquid received in the brake housing is acted upon by the vanes and pockets to provide a braking force. The rotor vanes are rotatably adjustable about radial axes extending radially from the axes of rotation of the rotor. The rotor vanes are automatically rotated about their own axes to increase the braking action with progressive rotation of the rotor.

3,702,178

ENGINE MOUNT ASSEMBLY

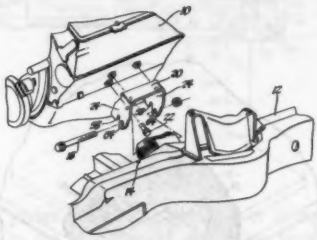
John C. Schulz, Franklin, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1971, Ser. No. 199,672

Int. Cl. B60k *5/12*

U.S. Cl. 248—9 **4 Claims**

An engine mount assembly for resiliently supporting an engine on a frame of a motor vehicle includes a bracket and preloaded mount assembly comprising two subassemblies which are secured together and to the frame. In one subassembly, rubber is moulded about a bushing and bonded to a base plate with the bushing dividing the rubber into separate bodies for taking engine jounce. In the other subassembly, a U-shaped plate has rubber roll pads bonded thereto which will cooperate with the bushing to control engine roll and also has rubber fore and aft pads bonded thereto which will cooperate with an engine attaching bracket to control fore and aft engine movement. The two subassemblies are secured together and to the frame and preload the rubber molded about the bushing. The engine attaching bracket is attached to the engine, saddles the frame attaching bracket at the fore and aft pads and is pivotally secured to the bushing.



3,702,179

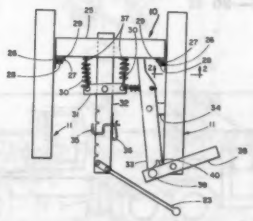
SLIDE RAIL ASSEMBLY

Arthur O. Radke, Milwaukee, and Garth O. Hall and Harvey N. Tengler, New Berlin, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 19, 1970, Ser. No. 90,970

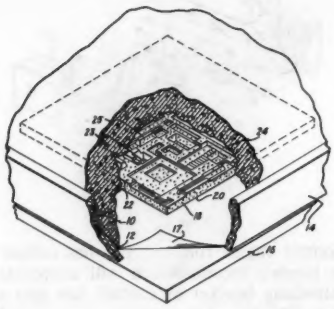
Int. Cl. F16m *13/00*

U.S. Cl. 248—430 **5 Claims**



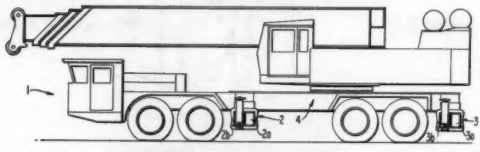
A track and rollers are engageable and are interposed between two relatively movable members to form a slide rail assembly. Two rollers are joined together by an axle, and a pivot pin passes through the axle and is mounted in a mounting flange that extends outward from one of the two relaitvely movable members parallel to and between the rollers. The pivot pin is thereby aligned with the path of relative motion and the rollers can pivot in a plane that is perpendicular to the direction of relative motion. Twisting of either of the relatively movable members thereby does not cause misalignment of the rollers with the track, and consequent jamming of the slide rail mechanism is prevented.

3,702,180
MOLD FOR CASTING CONCRETE PANELS
Robert L. Jones, Santa Ana, Calif., assignor of a fractional part interest to James T. Palm, Anaheim, Calif.
Continuation-in-part of application Ser. No. 569,397, Aug. 1, 1966, now Patent No. 3,515,779. This application Mar. 23, 1970, Ser. No. 21,755
The portion of the term of the patent subsequent to June 2, 1988, has been disclaimed
Int. Cl. E04g *11/00*
U.S. Cl. 249—188 6 Claims



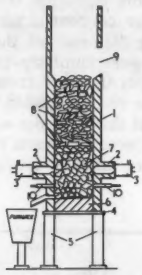
A mold is described that comprises a flat, thin plate formed from a rigid and substantially non-compressible cellular plastic foam, preferably polystyrene foam. The mold has a flat, smooth face and, on its opposite face, bears an intaglio pattern of an artistic relief.

3,702,181
HYDRAULIC OUTRIGGER JACK WITH SCREW LOCK
Joseph H. Keller, Jr., Hagerstown, Md., and Russell L. Sterner, Greencastle, Pa., assignors to Walter Kidde & Company, Inc., Clifton, N.J.
Filed Dec. 15, 1970, Ser. No. 98,258
Int. Cl. B60s *9/02*
U.S. Cl. 254—86 H 11 Claims



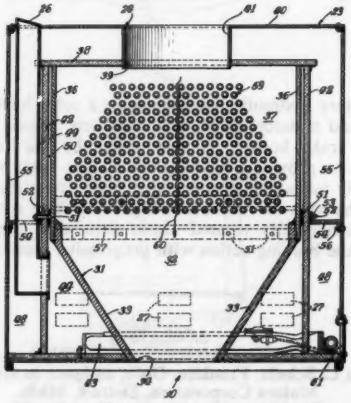
A hydraulic jack for use on the outriggers of a mobile crane wherein the jack is provided with a screw lock as a safety feature, for maintaining the jack in a desired extended position. The jack includes a piston reciprocably mounted within a cylinder, and in one embodiment the screw lock includes a member threadably mounted within the piston and adapted to engage one end of the cylinder to thereby lock the jack in the extended position. In another embodiment the screw lock includes a member threadably mounted within the cylinder and adapted to engage the piston to thereby lock the jack in the extended position.

3,702,182
MELTING OF IRON
Humphrey James Leyshon, Birmingham, England, assignor to British Cast Iron Research Association, Alvechurch, Birmingham, England
Filed Dec. 23, 1970, Ser. No. 100,972
Claims priority, application Great Britain, Jan. 23, 1970, 3,388/70
Int. Cl. F27b *1/08*
U.S. Cl. 263—29 10 Claims



A cupola furnace for melting iron is provided with combustion chambers for non-solid fuels, e.g. gas oil or gas, to be burnt with air only, disposed around the external wall of the melting zone. The combusted products of this non-solid fuel are injected into an upper stratum of a coke bed, provided in the furnace, to maintain the coke in incandescent condition and provide an initial melting stage of the furnace. Additional external heating means is also supplied to a lower stratum of the coke bed, in order to superheat the initially melted metal. This arrangement ensures efficient combustion of the fuel and obviates the need for using oxygen or oxygen-enriched air for combustion in the initial melting stage.

3,702,183
GRAIN DRIER
Donald Hull, Baylis, Ill., assignor to Mobile Dry, Inc.
Filed Feb. 10, 1971, Ser. No. 114,146
Int. Cl. F27b *5/00*
U.S. Cl. 263—41 20 Claims



A grain drier for drying moist granular crops, such as wheat, oats, beans, corn, etc. The drier includes a

drying chamber through which the grain is passed while being heated to a high temperature for a short period of time thereby to remove moisture therefrom. The dried grain is delivered from the drying chamber for delivery to a grain hopper or the like. The drier may be carried on a conventional combine. The drier includes means for adjusting the operating temperature suitably for different types of grain.

3,702,184

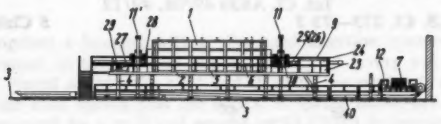
FURNACE INSTALLATION PARTICULARLY FOR MELTING GRAY IRON IN FOUNDRIES

Friedrich Munk and Gunter Korfer, Junkerath, Eifel, Germany, assignors to Junkerather Maschinenbau Gesellschaft mit beschrankter Haftung, Junkerath, Eifel, Germany

Filed May 10, 1971, Ser. No. 141,790

Int. Cl. C21c *1/00*

U.S. Cl. 266—13 **10 Claims**



A furnace installation comprises one or several melting furnaces, particularly electric furnaces and a preheating oven which is arranged before all of the other furnaces. The charge material is contained in large size containers which are transported through the preheating oven by means of a feeding device. The charge buckets are initially moved to the preheating oven on a vehicle which moves along a trackway and the buckets are either transferred from the vehicle vertically into an oven located over the trackway or laterally into a preheating oven located alongside the trackway. The same or similar wheeled vehicle is ararnged to receive the charge bucket at the exit end of the preheating oven and deliver it along a further length of trackway to one or more furnaces. A portion of the length of the trackway is advantageously made, so that it may swivel through an angle for delivering the preheated material selectively into one or more electric furnaces.

3,702,185

CYLINDER OPERATED POWER CLAMP

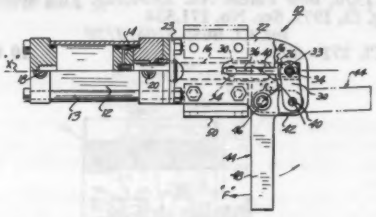
Leland F. Blatt, 790 Shoreham Road, Grosse Pointe Woods, Mich. 48236

Filed Dec. 11, 1970, Ser. No. 97,165

Int. Cl. B23q *3/03*; B25b *1/04*

U.S. Cl. 269—32 **1 Claim**

A work clamp or hold down clamp used for holding workpieces against a corresponding surface which is power operated by a fluid motor having a piston and piston rod; the clamp comprises a pivot arm which is pivoted within an extension of the fluid motor and the outer end of the piston rod of the fluid motor is attached to one end of a link or swing lever and the other end of the swing lever is attached to the pivot arm; the pivotal connection to the swing lever or link is by means of a pin which extends into a longitudinal slot provided in the extension of the fluid motor and which is disposed along the center line of the fluid motor; upon reciprocation of the piston of the fluid motor the pin which connects the piston rod to the swing lever is moved longitudinally in the slot causing the swing lever to follow and thereby pivot the clamp arm around its fixed pivot from release into clamping position or vice-versa.



3,702,186

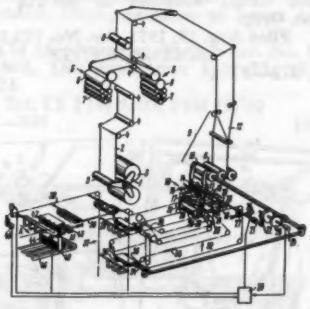
ROTARY WEB PRINTING MACHINE

Yakov Efimovich Duchinsky, Kiev, Grigory Avramovich Radutsky, Moscow, Rafail Efimovich Kheifets and Grigory Iosilfovich Zax, Kiev, and Nikolai Ivanovich Anikanov, Leonid Pavlovich Grachev, and Mikhail Evseevich Frumkin, Moscow, U.S.S.R., assignors to Izdatelstvo "Izvestia," Moscow, U.S.S.R.

Filed Feb. 18, 1971, Ser. No. 116,547

Int. Cl. B41f *13/58*

U.S. Cl. 270—6 **5 Claims**



A rotary web printing machine, such as a newspaper printing machine and the like is disclosed, of which the principal characteristic feature is that the delivering apparatus for delivering folded sheets, e.g. newspapers from said machine comprises a deflector for directing the folded sheets leaving the folder of the machine alternatingly along two different paths, into either one of two flyer drums disposed side-by-side under this deflector, each flyer drum being associated with a comb rest removing the folded sheets from the flyer drum and directing them into the respective bin disposed therebelow, in which a stack of folded sheets is formed.

3,702,187

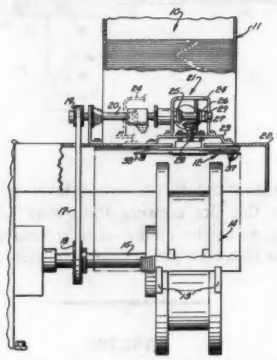
APPARATUS FOR SEPARATING SIGNATURES IN A GATHERER

Carlton V. Hageman and Victoriano F. Rana, Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Continuation-in-part of application Ser. No. 45,010, June 10, 1970, now Patent No. 3,650,525. This application Aug. 13, 1971, Ser. No. 171,534

Int. Cl. B65h *3/08, 3/50*

U.S. Cl. 271—29 **10 Claims**



A signature gatherer for the production of books or booklets with gate-folded pages which includes a bi-directional rotary disc separator for separating signatures at their folded corners, whether stacked for feeding gate-folded or standard-folded signatures.

3,702,188

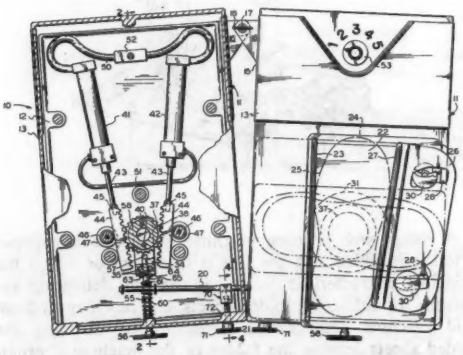
THERAPEUTIC EXERCISER WITH REGULATABLE HYDRAULIC TORSIONAL RESISTANCE

Cecil E. Phillips, Fay M. Bennett, and Robert L. Larson, Eugene, Oreg., assignors to Saf-Pla Corporation, Eugene, Oreg.

Filed Aug. 19, 1971, Ser. No. 173,127

Int. Cl. A63b *21/22*

U.S. Cl. 272—57 A **6 Claims**



A therapeutic exerciser for active external adductive and abductive rotation of ankles, knees and hips furnishes uniform torsional resistance throughout the complete range of movement thereof. The exerciser includes a pair of floor mounted based members and a rotatable foot-receiving member pivotally mounted on each base member. Hydraulic cylinders mounted in each base member and operatively attached to each foot-receiving member supply constant torsional resistance to each such member throughout the full range of adductive and abductive rotation thereof. A valve is provided to regulate the amount of resistance applied by the cylinders. The exerciser further includes a spring operated plunger in association with each foot-receiving member optionally to lock the same with respect to its base member to permit isometric exercise of the limbs. The distance between base members may be extended selectively to vary the distance between the foot-receiving members.

3,702,189

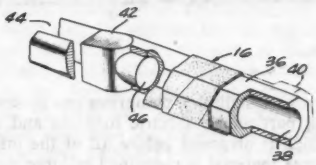
TENNIS RACKET

Thomas P. Galich, 2314 San Ysidro Drive, Beverly Hills, Calif. 90210

Continuation-in-part of application Ser. No. 863,868, Oct. 6, 1969, which is a continuation-in-part of application Ser. No. 770,467, Oct. 7, 1968, which in turn is a continuation-in-part of application Ser. No. 680,683, Nov. 6, 1967, now abandoned. This application Mar. 4, 1971, Ser. No. 121,016

Int. Cl. A63b *49/08, 49/12*

U.S. Cl. 273—73 J **5 Claims**



The invention in certain embodiments provides a one piece tennis racket cast in a permanent mold from nonferrous materials including magnesium alloys. The frame of the racket in one embodiment includes a head portion having radially disposed holes cast in planar alignment with each other and communicating with an annular groove into which the stringing or netting is nested and protected from damage. In another embodiment, the head portion includes a plurality of openings disposed in parallel alignment and arranged in a predetermined cross-sectional configuration so as to provide continuous contact for the stringing or netting. The frame also includes a handle portion with the center or shaft region being formed into twin or bifurcated arms which diverge in a neck portion adjacent to the head portion. In still another embodiment the unit is forged from a nonferrous metal, preferably aluminum or an aluminum alloy, with bridging reinforcing elements for added strength and protection against acoustic fatigue.

3,702,190

AUTOMATED FOOTBALL GAME

Kenneth M. Waldrop, 1545 N. 43rd St., Lawton, Okla. 73501

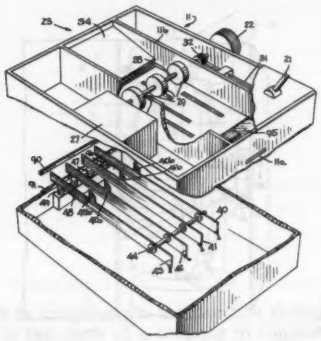
Filed Feb. 16, 1970, Ser. No. 11,595

Int. Cl. A63f *7/06*

U.S. Cl. 273—94 R **6 Claims**

A fully automated football game is disclosed in which an offensive player is moved in any direction along a simulated football field and wherein defensive players are located along the football field to stop the progress of the offensive player. The movement of the offensive player is controlled by playing cards which have perforations

coded thereon which correspond to different predetermined offensive plays. A play maker is provided for sensing the perforations in the playing cards and for controlling a pair of motors which move the offensive player along the football field in accordance with the play coded on the card being sensed. The play maker



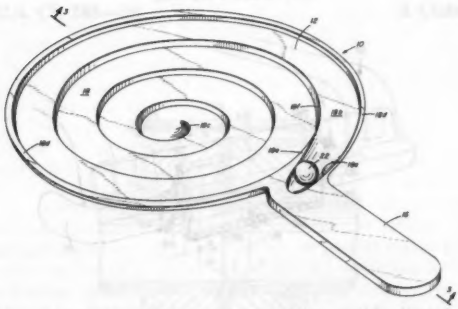
comprises a housing with a play card insertion opening. Mounted in the housing are a plurality of levers which are biased against the card and through the perforations as the card moves past the levers. A spring motor-roller is engaged by a card and wound up as a card is inserted, and upon release of the spring motor the roller drives the card past the levers and outwardly of the housing.

3,702,191

BALL AND RACEWAY AMUSEMENT DEVICE

Tadas Zilius, Hopewell, N.J., and Joseph Simboli, Cheyney, Pa., assignors to Columbia Broadcasting Systems, Inc.

Filed Feb. 25, 1971, Ser. No. 118,687
Int. Cl. A63b *67/14*
U.S. Cl. 273—112 **6 Claims**



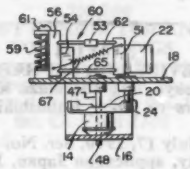
An amusement device consisting of a pan-like paddle, concave on one face and convex on the other, provided with an integral radially extending handle, both faces having formed thereon an inclined spiral raceway extending from a point at the outer periphery thereof near the handle and terminating in a ball-receiving depression at the center. A ball of marble is caused to move up or down the raceways by properly tilting the paddle, greater skill being required to keep the ball on the raceway on the convex side than on the concave side.

3,702,192

MAGNETIC TAPE REPRODUCING DEVICE

William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation of abandoned application Ser. No. 567,126, July 22, 1966. This application Oct. 2, 1969, Ser. No. 866,078
Int. Cl. G11b *21/08*
U.S. Cl. 274—4 A **4 Claims**



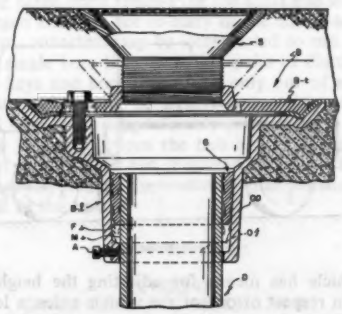
A mounting for supporting a magnetic tape head which is movable between the different tracks of a recorded multi-track magnetic tape includes a parallel linkage having at least three bars each of which are pivotally connected to a support block, which is positioned parallel to the magnetic tape, at one end and to a movable bracket receiving the tape head at the other end. Two of the bars have one end pivotally connected to opposite sides of the block and the other end of each is inserted in the corresponding sides of the head bracket near the top thereof to pivotally mount the bracket and the head to the block. The third bar is equal in length to the first two bars and is pivotally connected between the block and the bracket near the bottom of the head. The linkage maintains the face of the tape head parallel to the plane of the magnetic tape and prevents torsional rotation thereof with the same being moved between the different tracks of the tape.

3,702,193

SELF-RETAINING AND SEALING JOINT GASKETING SLEEVE

George J. Flegel, Michigan City, Ind., and William L. Zopfi, Ferndale, Mich., assignors to Josam Manufacturing Co.

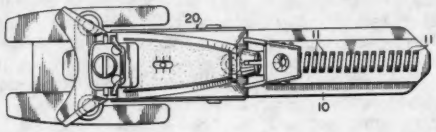
Continuation of abandoned application Ser. No. 863,791, Oct. 6, 1969. This application Feb. 22, 1971, Ser. No. 117,724
Int. Cl. F16j *9/00*; F16l *19/00*
U.S. Cl. 277—209 **15 Claims**



An elastomeric seal collar or gasket sleeve insertable by axially applied force and self-retaining in sealing relation and position between coaxially disposed non-grooved, non-ribbed telescoped elements such as a caulked

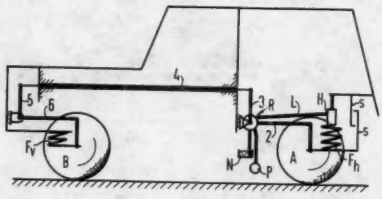
type body outlet of a drain and a pipe stub. A generally cylindrical annular body has an internal set and an external set of integral axially spaced similar circumferential fins, the internal set axially rearwardly offset from the external set. For the fins, sloping backwardly from the insertion leading end of the body, a particular form is described and the trailing end of the body is provided with an external arcuate sealing rim and a broad end face, grooved for driving tool engagement and to allow sealing compression for the rim.

3,702,194
SLIDING DEVICE FOR SKI HEEL BINDING
Michio Iizuka, Tokyo, and Toshikazu Kikuchi, Ichikawa, Japan, assignors to Hope Kabushiki Kaisha, Tokyo, Japan
Filed July 17, 1970, Ser. No. 55,632
Claims priority, application Japan, Jan. 12, 1970, 45/3,352
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35 T **2 Claims**



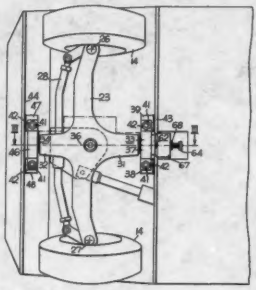
A sliding device for a ski boot heel binding includes a base with a number of evenly spaced projections and a worm (a short revolving screw gear) connected to a body of the ski heel binding. The end of the worm is provided with a groove. When the worm is rotated, using a screwdriver or other suitable tool, by means of the groove, the worm as well as the ski heel binding will move forward or rearward because of the worm's engagement with the projections on the base.

3,702,195
MOTOR VEHICLE
Dieter Lutz, Schweinfurt, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany
Filed Aug. 3, 1970, Ser. No. 60,240
Claims priority, application Germany, Aug. 5, 1969, P 19 39 719.4
Int. Cl. B16g *17/04*
U.S. Cl. 280—104 **20 Claims**



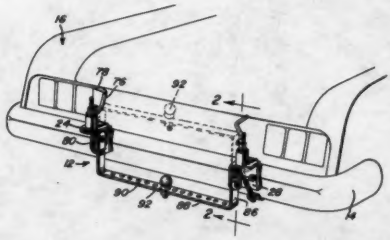
A vehicle has means for adjusting the height of the chassis in respect of one of the vehicle axles, a level control connected to the adjusting means, and height indicating or measuring means interposed between both vehicle axles and the chassis, these height measuring means so controlling the level control means that the latter responds solely to deviations from a desired height of the chassis as measured.

3,702,196
STEER AXLE WITH LONGITUDINAL ADJUSTMENT
Edward V. Krutis, Monee, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed May 6, 1971, Ser. No. 140,699
Int. Cl. B60g *25/00*; B62d *37/00*
U.S. Cl. 280—111 **6 Claims**



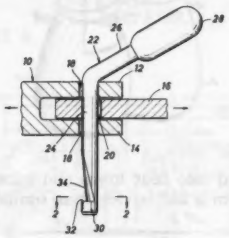
A pair of longitudinally spaced bearings mount the steer axle of an industrial truck for oscillation about a longitudinal axis. One of the bearings is longitudinally adjusted by a single screw acting against an end cap on the outer end of the one bearing. The cap also serves to seal the outer end of the one bearing against egress of lubricant and ingress of foreign material.

3,702,197
TRAILER HITCH
Aubrey G. Sellers, Kent, Ala., assignor to G. E. Causey, Eclectic, and Jessee W. Pienezza, Tallassee, Ala., fractional part interest to each
Filed Nov. 24, 1970, Ser. No. 92,460
Int. Cl. B60d *1/14, 7/00*
U.S. Cl. 280—502 **10 Claims**



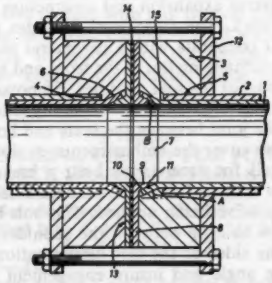
A trailer hitch attachable to the rear bumper of an automobile in the form of a generally L-shaped member having upper adjustable hook means engaging the upper edge of the bumper and a lower adjustable hook means engaging the lower edge of the bumper and being manually adjustable by a screw threaded assembly to enable quick, safe and rigid assembly of the trailer hitch with the bumper. The trailer hitch includes a single unit in which the hitch ball is mounted at the rear of the L-shaped member or a dual unit in which an adjustable interconnecting bar extends between two of the L-shaped members with the hitch ball mounted thereon.

3,702,198
HITCH OR COUPLING PIN
David W. Alley, 5917 Harbrook, Houston, Tex. 77017
Filed Sept. 14, 1970, Ser. No. 72,029
Int. Cl. B60d 1/02
U.S. Cl. 280—515 5 Claims



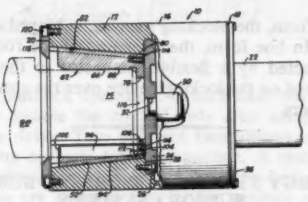
A hitch or coupling pin for insertion through aligned openings in two parts of a coupling to connect the same together and having means for preventing accidental disconnection of the coupling by dislodgement of the pin but which permits the pin to be readily removed by lifting the pin out of the openings. The pin is provided with means tending to tilt the pin away from a position in alignment with the openings of the coupling when the pin is inserted therethrough and means engageable with the coupling to prevent removal of the pin when the pin is so tilted, but which permits the pin to be lifted out of the openings to disconnect the parts when the pin is held in alignment with the openings.

3,702,199
ASSEMBLIES OF TUBULAR MEMBERS
Geoffrey N. Brooks, Stalybridge, and John L. F. Crompton, Handforth, England, assignors to Dunlop Holdings Limited, London, England
Filed June 17, 1970, Ser. No. 46,976
Claims priority, application Great Britain, July 16, 1969, 35,705/69
Int. Cl. F16l 23/00
U.S. Cl. 285—55 2 Claims



An assembly of tubular members in which two tubular members each having an outer shell and an inner protective lining such as an elastomer lining are coupled together at adjacent ends. The lining of each tubular member extends beyond the outer shell at the respective adjacent end and each tubular member carries an annular coupling flange, the coupling flanges being clamped together. An annular insert lies between the tubular members and at least part of the extending portion of each lining is compressed between the annular insert and an inner face of the respective coupling flange at an acute angle to the longitudinal axis of the tubular members and is in fluid tight sealing contact with the insert and the inner face of the respective coupling flange.

3,702,200
HUB-TO-SHAFT CONNECTOR AND METHOD FOR COUPLINGS
Kenneth K. Carman, Ellicott City, Md., assignor to Koppers Company, Inc.
Filed June 14, 1971, Ser. No. 152,718
Int. Cl. F16d 1/06
U.S. Cl. 287—52.5 12 Claims

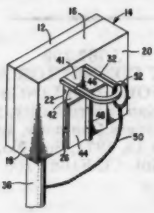


A method of connecting a shaft coupling hub to a shaft for rotation therewith by inserting the shaft end into a bore in the hub, the shaft end preferably including a pair of diametrically opposed flat surfaces and a pair of diametrically opposed arcuate surfaces, and, during insertion of the shaft end, simultaneously urging both the flat and arcuate surfaces into wedging engagement with the hub. The preferred apparatus for performing the method comprises a connector having a hub connected to the coupling with a bore for receiving the shaft end. The hub includes a pair of diametrically opposed wedge keys and a pair of diametrically opposed bore liners between the keys, all of which are in alignment with corresponding surfaces on the shaft end. Both keys and bore liners are retained in axially converging recesses in the bore and are adapted for movement along axially converging paths provided by the recesses thereby wedging the shaft end between the keys and bore liners and, in effect, with the hub. The keys and bore liners are suitably retained in the recesses; they may be spring loaded to urge them along axially diverging paths upon removal of the shaft end to provide an enlarged entrance for re-entry of the shaft end. If desired, the connector may be constructed to use a single key and single bore liner or to use pairs of diametrically opposed keys and bore liners with only one of each pair being moveable along an axially converging path. The keys and bore liners are preferably constructed to be automatically wedged between the hub and shaft end by insertion of the shaft end but, if desired, may be constructed to be manually wedged therebetween after insertion of the shaft end in the hub.

3,702,201
DOOR LOCKING MECHANISM
Barry A. Elisofon and Judith Elisofon, both of 2010 Newkirk Ave., Brooklyn, N.Y. 11226
Filed July 26, 1971, Ser. No. 165,968
Int. Cl. E05c 17/44
U.S. Cl. 292—338 7 Claims

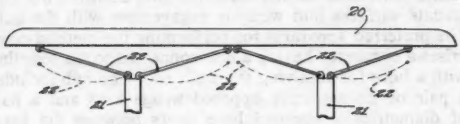
A "police" type door-locking device in which a lock-operated tongue having a rod-end receiving, channel

shaped extension is moved by the lock from the space between a lock chamber to a rod-end confining chamber, on which a blocking member for preventing the movement of the tongue is movably supported for movement into and out of the space between the chambers. In the



preferred form, the blocking member is hinged on the lock chamber. In one form, the uper end of the rod is releasably connected by a flexible connector to the rod-guide bight secured on the locking device over the space between the chambers.

3,702,202
ENERGY STORING/ABSORBING BUMPER SUPPORT SYSTEMS
Rollin Douglas Rumsey, Buffalo, N.Y., assignor to Houdaille Industries Inc., Buffalo, N.Y.
Filed Apr. 30, 1970, Ser. No. 33,260
Int. Cl. B60r *19/08;* **F16f** *7/00*
U.S. Cl. 293—89 **44 Claims**



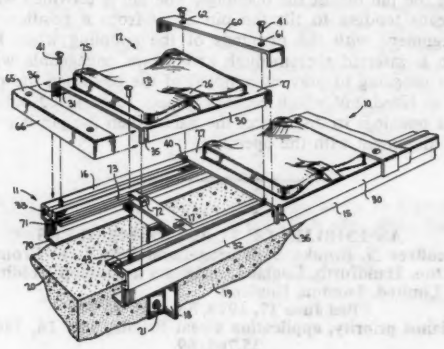
Buckling columns, i.e. steel bars having stiff spring resiliency, provide bumper support enabling returnable yielding of the bumper after at least a predetermined maximum impact pressure thereagainst. In an automobile bumper a safe impact load provision of five miles per hour for a four thousand pound vehicle permitting about two inch deflection under pressure will eliminate a substantial amount of potential damage to an automobile bumper. Excessive rebound energy may be damped by inserting friction buffing and damping into the system.

3,702,203
CONTAINER CARRIER
George F. Oltmanns, 2528 Pensacola Ave., Chicago, Ill. 60618
Filed Oct. 19, 1970, Ser. No. 81,887
Int. Cl. B65d *23/10*
U.S. Cl. 294—87.2 **4 Claims**

A carrier for two or more containers having a peripheral enlargement comprises a strip-form blank composed of transversely rigid material and having integrally formed, transversely offset handle loops at opposite ends of a medial strap portion. The carrier is deflected into a figure 8 configuration with the handle loops oppositely disposed at the juncture of the loops forming the figure 8 and with the medial strap passing through the handle loops, thereby to form a carrier for conveniently transporting a pair of containers. A pair of the carrier blanks

may be formed into four loops and joined together in a manner to form a carrier for four similar containers.

3,702,204
MODULAR SEATING ASSEMBLY
Max E. Tipton, Easton, and Wilmer R. Schultz, Emmaus, Pa., assignors to Wilmer R. Schultz, Emmaus, Pa.
Filed Sept. 15, 1970, Ser. No. 72,416
Int. Cl. A47c *1/12*
U.S. Cl. 297—248 **36 Claims**

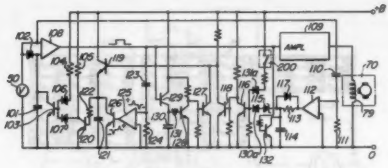


Modular seats molded of plastic material are securely supported on an elongated framework by fasteners extending between and abutting the adjacent side edges of the seats while serving to accommodate differential longitudinal and transverse expansion and contraction with respect to the framework. The framework includes parallel support rails that cooperate with a peripheral planar area or portion and overhanging lips at the front and back for nonstressing support of the seat modules. Embossments on the lips provide transverse snugness. Laterally extending finish strips cover the joint between the seats and hold down the edges, and also cover the embossments. A slot is provided along each rail for receiving a bolt; a barrel nut being driven on the bolt to fasten the seat modules in position with only top drive being applied. The bolt head is sufficiently narrow to drop between the shoulders of the slot whereupon the sides of the slot limit rotation of the bolt to an oblique angle and insure engagement of the head with said shoulders in fastening relationship. The nut includes a cylindrical body having a lower face for engagement with the framework in frictional locking relationship; the body being substantially the same length as the thickness of the panels (such as the finish strip and seat or transport trailer skin) to obviate compression stresses within said panels and allow a floating interconnection for differential expansion and contraction and mechanical vibration.

3,702,205
ANTI-SKID DEVICE FOR AUTOMOTIVE VEHICLES

Hiroshi Arai and Akira Nakamura, Toyota, Atutoshi Okamoto, Toyohashi, and Shunji Okumura, Kariya, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, and Nippondenso Kabushiki Kaisha, Aichi-ken, Japan

Filed Oct. 13, 1970, Ser. No. 80,431
Claims priority, application Japan, Oct. 18, 1969, 44/83,410
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 A 5 Claims



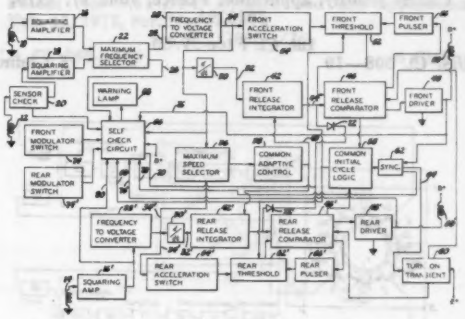
An anti-skid device for an automotive vehicle is disclosed comprising a wheel speed voltage generator for generating a wheel speed voltage corresponding to a wheel speed; a reference wheel speed voltage generator which generates a reference wheel speed voltage corresponding to a reference wheel speed which, being initially lower than a wheel speed, is reduced at a first set decelerating rate with the decrease in wheel speed at the time of braking. A differential amplifier which generates a signal to reduce the braking pressure when said reference wheel speed voltage is higher than said wheel speed voltage; said wheel speed voltage generator, reference wheel speed voltage generator and differential amplifier constituting a lock detector means. A pressure difference detector is provided for generating a signal when the braking pressure of a wheel cylinder is equal to that of a master cylinder; while a control means switches said reference wheel speed voltage generator from a first set decelerating rate to a lower second set decelerating rate when said pressure difference detector generates a signal after the generation of a braking-pressure reducing signal by said differential amplifier; and a braking pressure modulator means reduces the braking pressure according to a signal from said differential amplifier. The maximum value of the friction coefficient between the wheels and a road surface is sought while the maximum tire torque corresponding to said maximum friction coefficient is obtained, to control the braking pressure efficiently and safely on a road surface with any friction coefficient from a frozen road to a concrete-paved road without the locking of wheels, irrespective of the manner in which a vehicle driver applied the braking force to the wheels.

3,702,206
SYNCHRONIZING CIRCUIT FOR FOUR-WHEEL ANTILOCK BRAKE CONTROL SYSTEM

Douglas W. Sweet, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 9, 1971, Ser. No. 151,238
Int. Cl. B60t *8/12*
U.S. Cl. 303—21 R 3 Claims

A four-wheel antilock brake control system has at least three wheel speed sensors, each having one side grounded. One sensor for a non-driven wheel is monitored to assure circuit continuity between the sensor and the control circuit. All the sensor outputs are monitored by a self-check circuit to detect any sensor malfunction and to disable the control in the event of a malfunction. The self-check circuit further disables the control if a substantially zero rear wheel speed is indicated during periods of substantial front wheel speed, thus preventing the occurrence of antilock brake cycling in the front wheels when the rear wheels approach a lock-up condition. The self check circuit further disables the control when any brake modulator is not in its normal position prior to a request by the

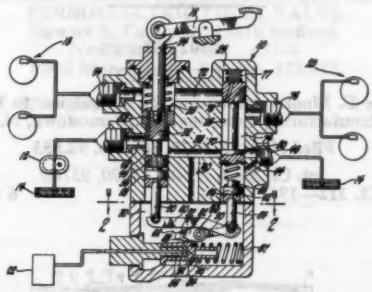


control for antilock operation. In each case, the self-check circuit will disable the control only after some predetermined time delay. Two different time delays are accomplished using a single timing capacitor. A circuit is provided to release the rear brakes briefly when and if the front brakes are released first by the antilock control.

3,702,207
FLUID PRESSURE PROPORTIONING UNIT

Daniel A. Armstrong, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation-in-part of abandoned application Ser. No. 63,365, Aug. 13, 1970. This application Nov. 10, 1970, Ser. No. 88,456
Int. Cl. B60t *8/18*
U.S. Cl. 303—22 A 3 Claims



A fluid proportioning unit for a motor vehicle braking system in which the pressure output of a valve member operates the front wheel brakes and acts through a lever which is pivoted on a fulcrum mechanism to operate another valve member which controls the rear wheel brakes. The fulcrum mechanism includes a cam having a cam surface constructed so that the point of contact between the cam and the lever migrates across the lever as the lever rotates to progressively decrease the proportion of front brake pressure which is transmitted to the rear brakes in order to compensate for the dynamic weight transfer characteristics of the vehicle. A piston controlled by the pressure in a load leveler system rotates the cam prior to brake actuation to adjust the proportioning unit according to the vehicle static load.

3,702,208

MAGNETIC BEARINGS

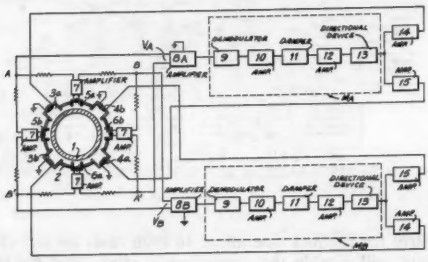
Helmut Habermann, 2 Allee Principale; Loyen Roger, 27 Allee Circulaire; and Pierre Joly, 18 Allee Circulaire, all of Vernon, France

Filed June 16, 1971, Ser. No. 153,710

Claims priority, application France, June 17, 1970, 7022292

Int. Cl. F16c 39/06

U.S. Cl. 308—10 5 Claims



A magnetic bearing such as for a satellite comprises two relatively rotatable members, one of which is at least partly constituted of a magnetic material while the other is provided with at least one pair of electromagnets. The electromagnets in each pair are arranged to act in opposition on the magnetic material and are connected to a respective pair of detecting devices for detecting the relative positions of the two members of the bearing, the detecting devices being connected in opposition and being arranged to control the electromagnets so that any relative displacement in one direction or the other between the two members of the bearing is nullified by the combined action of the electromagnets.

3,702,209

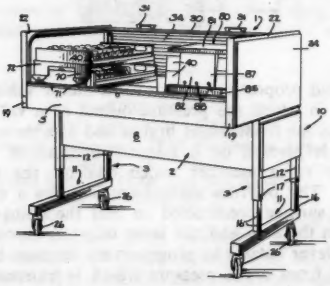
FILE CABINET

George E. Moore, Jamestown, N.Y., assignor to Watson Manufacturing Company, Inc., Jamestown, N.Y.

Filed Nov. 25, 1970, Ser. No. 92,553

Int. Cl. A47b 17/00, 88/00, 95/00

U.S. Cl. 312—196 6 Claims



An improved file cabinet which has an adjustable posting board and adjustable height. The posting board being slidable on adjustable tracks.

3,702,210

FOWL CARRIER

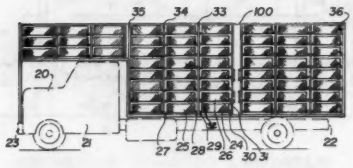
Kenneth A. Farrugie, 19 Kensington Ave., Brantford, Ontario, Canada

Filed Aug. 3, 1971, Ser. No. 168,580

Claims priority, application Canada, May 20, 1971, 113,522

Int. Cl. A47b 53/00, 7/00, 87/00

U.S. Cl. 312—198 6 Claims



The invention relates to a slidable fowl carrier adapted to be mounted in rack-style on the transporting vehicle body. Each of the fowl carriers is divided into pivotally attached compartments which extend transversely from one side of the transport vehicle to the other and are slidably supported by horizontal stringer members which, in turn, are supported on vertical upright members resting on the transport vehicle. Each compartment of the carrier is separated from the adjoining compartment by a partition preferably covered by metallic screening material.

3,702,211

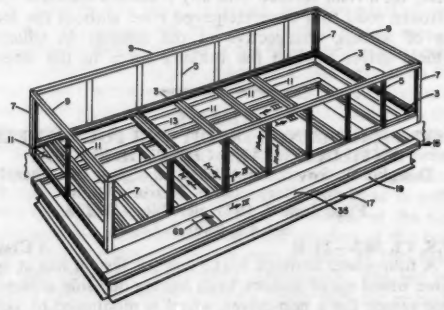
FRAME FOR ROOFTOP AIR CONDITIONER

Robert L. Young, Liverpool, Russell E. Wood, East Syracuse, Samuel D. Farney, North Syracuse, and Arnold U. Hogan, Verona, N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed July 14, 1971, Ser. No. 162,554

Int. Cl. A47b 47/08, 57/08; E04b 7/18

U.S. Cl. 312—257 6 Claims



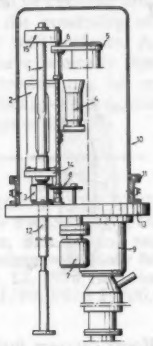
A frame for a rooftop air conditioning unit for mounting heating and/or cooling elements therein and suitable access panels thereon to provide an integrated, weathertight air conditioning unit.

3,702,212

METHOD AND DEVICE FOR THE MANUFACTURE OF ELECTRON TUBES

Jean-Charles Viers, Brive-la-Gaillarde, and Robert Pierre Jaure, Rolland-Brive-la-Gaillarde, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 15, 1969, Ser. No. 841,751
Claims priority, application France, July 16, 1968, 159,306
Int. Cl. H01j *9/38, 17/36*
U.S. Cl. 316—3 7 Claims



A method and apparatus for manufacturing, within an evacuated housing, radiation sensitive electron tubes comprising vapor-depositing a plurality of window sections of the envelope of the electron tube in sequence, checking for defects after a layer is formed on each window section until a window without defects is found, and then sealing this window to the glass envelope comprising the elements of the electron tube.

3,702,213

REFLEX LIGHT REFLECTOR SHEET AND METHOD FOR ITS MANUFACTURE

Kurt Schwab, Innsbruck, Tirol, Austria, assignor to D. Swarovski & Co., Tirol, Austria

Filed July 30, 1969, Ser. No. 847,528
Int. Cl. G02b *5/12*
U.S. Cl. 350—105 9 Claims

Reflex light reflector sheet of the kind wherein a spacer layer is interposed between substantial spherical transparent beads and a rear mirror surface. The spacer layer is formed from a smooth, prefabricated self-supporting transparent plastic foil which is deformed so as to snugly conform to and envelop the rear contours of the spherical beads. The deformation of the spacer layer foil is accomplished by subjecting the foil with the beads placed thereon to a pressure differential such as by applying vacuum to one side of the foil.

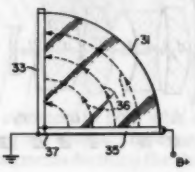
A plane cover layer may be superimposed on the front portion of the beads and the beads are bonded by a suitable binder.

3,702,214

ELECTRO-OPTICAL DEVICE FOR CONVERSION OF TANGENTIAL AND RADIAL POLARIZATION COMPONENTS TO RECTANGULAR CO-ORDINATE COMPONENTS

Joseph P. Segre, Acton, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Original application Sept. 2, 1969, Ser. No. 854,704, now Patent No. 3,617,934. Divided and this application Feb. 12, 1971, Ser. No. 115,052
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 6 Claims



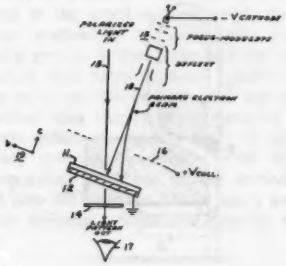
An electro-optic crystal such as lithium niobate is formed into a half waveplate to convert tangential and radial polarization components in a laser beam to rectangular co-ordinate components. To achieve this polarization conversion a transverse electric field is applied to the crystal in an uniform strength pattern such that the direction of the field varies with the angular position in the crystal changing at the same rate as the angular rate of change of position in the crystal. Such polarization conversion devices are combined with a laser and in a laser cavity to limit laser oscillations in the laser cavity to be either only tangentially polarized or only radially polarized.

3,702,215

ELECTRON BEAM CONTROLLED BISTABLE FERROELECTRIC LIGHT VALVE

Stewart E. Cummins, 11810 Stafford, New Carlisle, Ohio 45344

Filed Mar. 8, 1971, Ser. No. 122,012
Int. Cl. G02f *1/26*
U.S. Cl. 350—150 2 Claims



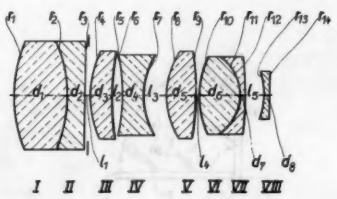
Ferroelectric domains in a crystal of ferroelectric bismuth titanate ($Bi_4Ti_3O_{12}$) are switched between two stable states, by a controlled electron beam. One state provides optical transparency and the other optical opacity, in a polarized light system. The bistables action of the ferroelectric domains in the crystal provides a multicell memory device with nondestructive optical read-out.

3,702,216

PHOTOGRAPHIC LENS OF HIGH IMAGE-RESOLVING POWER COMPRISING TWO DOUBLETS AND FOUR SINGLE LENS ELEMENTS

Harald Maenz, Jena, and Gerhard Risch, Weimar, Germany, assignors to Jenoptik Jena G.m.b.H., Jena, District of Gera, Germany

Filed Jan. 29, 1971, Ser. No. 109,266
Int. Cl. G02b 9/62
U.S. Cl. 350—215 3 Claims



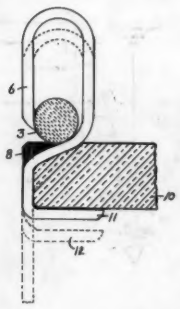
A photographic lens of high-image resolving power comprises two doublets and four single lens elements. It defines a field angle of $2\delta=10°$ with an aperture of 0.36, and a field angle of $2\delta=14°$ with an aperture of 0.25. The image errors are highly corrected, and the wave aberration lies within the Rayleigh limits. The lens members, from object side to image side, are arranged under definite conditions as follows: a positive doublet, an aperture diaphragm, a positive meniscus, a biconcave element, a biconvex element, a positive doublet, and a biconcave element.

3,702,217

OPHTHALMIC MOUNTING FOR TENSIONALLY SECURING LENSES THERETO

Louis J. Page, New York, N.Y.
(191—21 Hillside Ave., Hollis, N.Y. 11423)

Filed May 20, 1971, Ser. No. 145,447
Int. Cl. G02c 1/02
U.S. Cl. 351—106 3 Claims



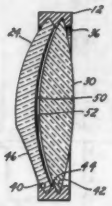
An ophthalmic mounting for tensionally securing lenses thereto by means which comprises rim members having adjustable arms attached thereto, said arms extending rearwardly from said rim members and redirected forwardly forming a loop, the forward portion of the arms being bent over to engage the front surface of the lens, said arms being adjustable up, down, in or out relative to the rim member so that inaccuracies in preparing the lenses for mounting can be compensated for.

3,702,218

TEMPORARY CATARACT FITTINGS

Robert G. Manhire, Box 235, Oldwick, N.J. 08858

Continuation-in-part of abandoned application Ser. No. 807,848, Mar. 17, 1969. This application Jan. 25, 1971, Ser. No. 109,595
Int. Cl. G02c 7/06
U.S. Cl. 351—167 1 Claim



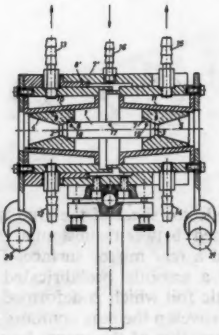
A temporary bifocal cataract fitting in which two circular plastic lenses of substantially the same diameter are removably retained within each rim of a plastic eyeglass frame, the lenses having a small but substantially uniform air space between them.

3,702,219

GRAPHITE TUBE CELL ASSEMBLIES FOR ATOMIC ABSORPTION SPECTROMETERS

Klaus Braun and Kurt Manthey, Uberlingen, and Bernhard Welz, Meersburg, Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Uberlingen am Bodensee, Germany

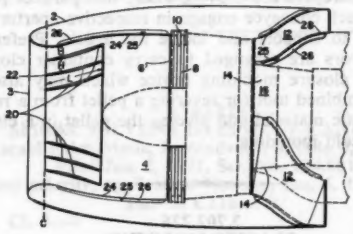
Filed Feb. 5, 1971, Ser. No. 112,855
Claims priority, application Germany, Feb. 11, 1970, P 20 06 032.6
Int. Cl. G01j 3/30; G01n 21/16
U.S. Cl. 356—244 3 Claims



A known type of heated sample cell assembly for atomic absorption spectroscopy includes an open-ended graphite sample tube having a central hole for initially introducing the sample into the tube and for allowing an

inert gas to circulate from the otherwise closed housing into the tube to protect the interior surfaces from oxidization when the device is heated, as by large electrical currents supplied from electrodes in contact with both ends of the graphite tube. The present improvement includes the addition of two further holes near the ends of the graphite tube to reduce the speed at which a given total protective gas flow causes the same amount of sample to be expelled from the open end of the tube, thereby increasing useful measuring time. Preferably the end holes are offset so as to cause the gas flow entering the interior to be substantially tangential to the inner walls of the tube so as to form a helical or cyclonic flow along these walls, thereby minimizing the possibility of ambient air flow reaching these inner wall surfaces. Advantageously, the graphite tube may have conically tapered ends, and the (also graphite) electrodes may be annular and include complementarily conically-shaped inner surfaces mating with these conical ends of the tube.

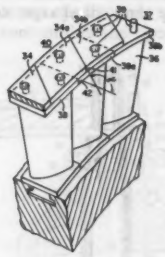
3,702,220
NOISE REDUCTION IN JET ENGINES HAVING FANS OR LOW PRESSURE COMPRESSORS
George E. Medawar, San Diego, and Felix Hom, La Mesa, Calif., assignors to Rohr Industries, Inc.
Filed Nov. 12, 1970, Ser. No. 88,541
Int. Cl. E04b *1/99;* **F01d** *29/00;* **F02k** *3/00*
U.S. Cl. 415—119 **16 Claims**



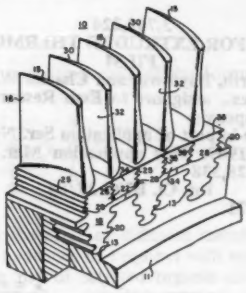
A turbofan jet engine employed in the propulsion of aircraft. The air inlet to a typical fan-jet engine is defined by the cowl and cowl lip ring which directs the incoming air to and through the fan, or low pressure compressor, having rotor and stator blades. The primary flow is directed into the combustion chamber where hot gases resulting from combustion are used to drive the fan or low pressure compressor. The secondary outer portion of the air pressurized by the fan is directed rearward around the outer edge of the inner engine defined by the inner cowl and the outer wall adjacent the combustion chamber and directed to provide a propulsive force from the engine. At least two annular splitter rings concentrically spaced are provided within the cowl forward of the fan or low pressure compressor.

3,702,221
CONTINUOUS SHROUDING-RIVETED CONSTRUCTION
Ralph J. Ortolano, Palos Verdes Peninsula, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Original application Sept. 30, 1969, Ser. No. 862,282. Divided and this application June 15, 1971, Ser. No. 153,199
Int. Cl. F01d *5/22*
U.S. Cl. 416—191 **3 Claims**

A circular shrouded rotor blade structure for an elastic fluid axial flow turbine or compressor comprising an annular row of blades and an annular series of arcuate segments associated with the blades and arranged in end-to-end relationship to form a continuous 360° shroud, wherein each pair of neighboring shroud segments is firmly riveted to a blade common to both with each segment being riveted to at least two blades. There may be more than one row of arcuate segments forming the shroud.



3,702,222
ROTOR BLADE STRUCTURE
Benjamin C. Bernales, Cincinnati, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 13, 1971, Ser. No. 106,040
Int. Cl. F01d *5/30*
U.S. Cl. 416—212 **6 Claims**

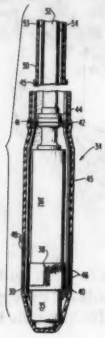


A bladed rotor structure for an elastic fluid axial flow turbine comprising an annular row of primary grooves, and a plurality of primary rotor blades of the side-entry type disposed in the grooves. Each blade has a root, the radially inner portion of the root being disposed in its corresponding groove in the rotor and the radially outer portion of each root being disposed outside of the rotor. The radially outer portion of each root has serrated edges which, together with the adjacent roots of the primary blades, jointly define an annular array of axially extending secondary grooves. Secondary rotor blades having roots corresponding in shape to the secondary grooves are inserted into the grooves, the primary and secondary blades jointly defining a transverse annular row of rotating blades.

3,702,223
HYDRAULICALLY OPERATED SYSTEM FOR SUBSURFACE OPERATIONS
David H. Bednar, Mountain Iron, Minn., assignor to Viking Explosives & Supply Inc.
Filed Oct. 7, 1971, Ser. No. 187,327
Int. Cl. F04b *35/02, 47/08;* **E21b** *43/00*
U.S. Cl. 417—375 **15 Claims**

Provision is made for removal of blast hole liquids hydraulically thus avoiding safety hazards of electrically op-

erated apparatus in blasting holes. Hydraulically driven submersible pump means are protected within electrically insulating boot means and connected through an abrasion resistant, electrically non-conductive sheathing cable which houses supply and discharge conduits. Reeling



means at the surface provide for lowering, raising, and suspending of the submersible apparatus with novel junction block and connector means providing above ground connection for the conduit means without inhibiting of reeling of the sheathing cable and housed conduits.

3,702,224

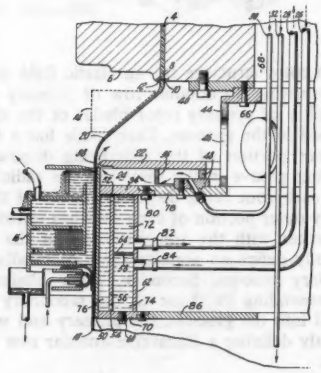
MANDREL FOR EXTRUDED THERMOPLASTIC FILM

Howard C. North, Baytown, and Charles W. Williamson, Seabrook, Tex., assignors to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 887,270, Dec. 22, 1969. This application Mar. 26, 1971, Ser. No. 128,338

Int. Cl. B29d *23/04*

U.S. Cl. 425—71 **10 Claims**



In the extrusion of a thermoplastic resin through a ring-die in a generally downward direction to form a tubular film, wherein the film is partially cooled by means of a cooling gas before being drawn over a cooling and sizing mandrel, the improvement characterized by using a mandrel having a flattened top, an uncooled upper section, a cooled lower section, a tapered profile in longitudinal cross-section and an external surface texture within the limits of 50 to 1,000 microinches RMS.

3,702,225

APPARATUS FOR MOULDING LINERS OF PLASTIC MATERIAL WITHIN CONTAINER CLOSURES

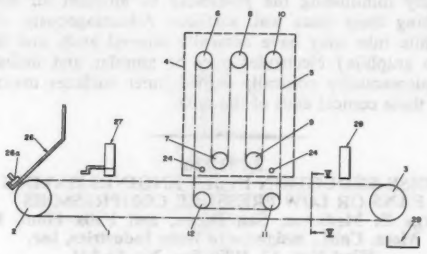
Gordon Asquith Deakin, Alan Eastwood, and Gordon Vinnicombe, all % W. R. Grace Ltd., Elneden Road, Park Royal, London NW. 10, England

Original application Oct. 28, 1968, Ser. No. 771,203, now Patent No. 3,587,819. Divided and this application May 7, 1970, Ser. No. 35,526

Claims priority, application Great Britain, Oct. 30, 1967, 49,134/67

Int. Cl. B29c *3/04, 17/14*

U.S. Cl. 425—112 **10 Claims**



The specification discloses a mechanism for transferring articles from one conveyor to another at a point where the two conveyors are moving along non-parallel paths. Studs on each conveyor engage in respective apertures in the article to support and locate the article. Preferably the conveyors are arranged to carry container closures through a closure moulding device which may also include a combined tool for severing a pellet from a rod of thermoplastic material and placing the pellet in a closure ready for cold moulding.

3,702,226

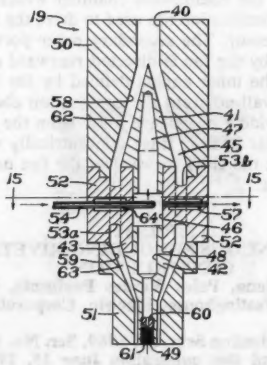
PLASTIC MOLDING

Heung T. Kim, Avon Lake, Ohio, and John P. Darby, Pompano Beach, Fla., assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Jan. 20, 1971, Ser. No. 108,087

Int. Cl. B29j *5/06*

U.S. Cl. 425—326 **7 Claims**



The molding of plasticized material wherein the die assembly has its mandrel cooled to restore a symmetrical heat and velocity profile to the annular melt and in addition provides means for the cooling of an adapter which divides the original plasticized melt from the extruder into

two cylindrical cross sectioned streams of material for movement into two separate dies. The adapter is cooled to restore the temperature and velocity profile.

3,702,227

EXTRUSION DIE FOR THE MANUFACTURE OF NETS OF ARTIFICIAL MATERIAL

Jacques Hureau, 18 Rue de la Glaciere, Paris 13, France

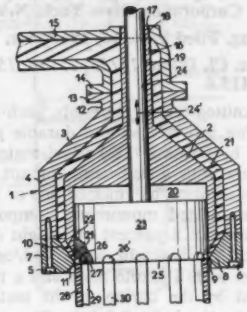
Division of application Ser. No. 872,196, Oct. 29, 1969, now abandoned. This application Apr. 29, 1971, Ser. No. 138,411

Claims priority, application France, Dec. 3, 1968, 176,368; Canada, Dec. 3, 1969, 068,920; Great Britain, Feb. 21, 1971, 9,507/71

Int. Cl. B29d *23/04;* **B29f** *3/04*

U.S. Cl. 425—466 **8 Claims**

An extrusion apparatus for producing tubular articles of a solidifiable extrudable material having a tubular structure. The apparatus has a tubular member open at one end. A core member is disposed axially within the tubular member and jointly therewith defines an annular space terminating in an annular extrusion orifice opening into the interior of the tubular member adjacent the open end thereof. The core member has a surface disposed axially spaced from the open end of the tubular member defining an innermost axially disposed boundary of said extrusion orifice relative to the open end of the tubular member. The core member has a bore defining a chamber on an end thereof adjacent the open end. A piston is mounted for reciprocation in the chamber selectively and alternately actuated in operation to a first position obstructing the annular extrusion orifice and a second position unobstructing the extrusion orifice. The piston lower circumferential edge portion has extrusion notches circumferentially spaced thereon open to side surfaces of the piston and an end face confronting the open end of the tubular



element. Separate, circumferentially spaced strands are extruded through these notches in a machine direction when the extrusion orifice is obstructed by the piston and an annular ring integral with the strands and as a continuation thereof when the extrusion orifice is unobstructed.

CHEMICAL

3,702,228

SPIRAL SOLVENT DYEING OF CANDLES

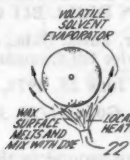
Harald Falck-Muus, Bogstadveien 8, Oslo 3, Norway

Filed Jan. 5, 1971, Ser. No. 104,001

Claims priority, application Norway, Jan. 6, 1970, 29/70

Int. Cl. C11b *3/00*

U.S. Cl. 8—6 **8 Claims**



The surface of a candle made from stearin, paraffin wax or the like is decorated by covering the surface with a fat soluble dye mixed with a volatile solvent such as turpentine; and then heating the surface locally with a source of heat such as a flame so that the dye goes into the material of the candle, which is liquified at the surface, where it floats, while the volatile solvent is driven off. When the surface of the candle is hardened, it can then be polished.

3,702,229

PRINTING OF ANIONIC DYES ON POLYCARBONAMIDES OF BIS(PARA - AMINOCYCLOHEXYL) METHANE AND DODECANEDIOIC ACID

Eugene E. Campana, Norwood, N.J., assignor to Ciba-Geigy Corporation, Greenburgh, N.Y.

No Drawing. Filed Dec. 29, 1970, Ser. No. 102,517

Int. Cl. D06p *5/04*

U.S. Cl. 8—62 **6 Claims**

Processes are provided for the printing substrates of silk-like linear, high molecular weight fibers containing at least 90% repeating units of the formula

wherein R is the same or different member of the class consisting of hydrogen and methyl with selected acid dyestuffs. By the use of selected organic carriers and dyestuffs used in conjunction with thiourea, excellent prints can be obtained. The printed substrates may be steam developed.

3,702,230

USE OF A POLYMER ADDITIVE TO IMPROVE THE OPTICAL BRIGHTENER ABSORPTION CHARACTERISTICS OF DURABLE-PRESS FABRICS

Eugene J. Blanchard, New Orleans, and Gloria A. Gautreaux and Robert J. Harper, Jr., Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 7, 1971, Ser. No. 104,782

Int. Cl. D06m *15/36, 15/58*

U.S. Cl. 8—100 **6 Claims**

A cotton fabric is treated with a solution containing polyvinylpyrrolidone-polyacrylate copolymer and a cross-linking agent with suitable catalyst to produce a durable press fabric which possesses the imparted desirable quality of being able to absorb optical brighteners normally included in laundry detergents. A white fabric treated by the process of this invention improves in whiteness with repeated launderings.

When the formulation is supplemented with low amounts of polypropylene glycol and alkyl ethyleneoxide alcohol the performance of the treated grament or fabric is further enhanced.

3,702,231

KNITTED TEXTILE MATERIALS COMPRISING POLYESTER FIBERS AND HAVING OUTSTANDING SOIL RELEASE AND DURABLE PRESS PROPERTIES AND A PROCESS FOR THE PREPARATION THEREOF

Edwin L. Dale, Spartanburg, S.C., assignor to Beaunit Corporation, New York, N.Y.

No Drawing. Filed Sept. 16, 1968, Ser. No. 762,311

Int. Cl. D06m *15/36, 15/38, 15/58*

U.S. Cl. 8—115.6 4 Claims

Polyester knitted textile materials, such as fabrics, having outstanding soil release and durable press properties are prepared by treating the knitted material comprising polyester fibers with a sufficient amount of a water-insoluble linear addition polymer of one or more monoethylenically unsaturated monomeric compounds and containing up to about 5 percent by weight of acid, present as acrylic acid, methacrylic acid, and/or itaconic acid, in conjunction with a textile resin and a textile resin catalyst followed by the curing of the textile resin to fix the additives to the knitted fabric. The so-treated textile material or fabric may then be processed by conventional methods to garments and other textile materials for various uses having outstanding soil release and durable press properties.

3,702,232

TRIS(2-CHLOROETHYL)PHOSPHORAMIDE USED AS A CROSSLINKING AGENT FOR CELLULOSIC COMPOSITIONS

Earl J. Roberts, New Orleans, Mary Ann F. Brannan, Metairie, and Stanley P. Rowland, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application June 24, 1970, Ser. No. 49,551. Divided and this application Nov. 19, 1971, Ser. No. 200,583

Int. Cl. D06m *13/26, 13/40, 13/44*

U.S. Cl. 8—116 P 2 Claims

Tris(2-chloroethyl)phosphoramide was prepared from ethyleneimine and phosphorus oxychloride and reacted with cotton cellulose in the form of fabric by a pad-dry-cure process in the presence of a basic salt, such as sodium carbonate. Reagent incorporation levels up to 6% by weight were achieved. Cotton fabrics modified with tris(2-chloroethyl)phosphoramide were found to have enhanced wrinkle recovery properties.

3,702,233

YTTRIUM PURIFICATION

J. R. Gump, Alma, Mich., and Tai K. Kim and Robert E. Long, Jr., Towanda, Pa., assignors to GTE Sylvania Incorporated

Filed Aug. 11, 1971, Ser. No. 170,744

Int. Cl. C22b *59/00*

U.S. Cl. 23—23 4 Claims

A solvent extraction process for separating yttrium from heavy rare earths having atomic number 65 through 71 is disclosed that comprises using an aminopolycarboxylic acid and a buffering agent in the aqueous phase followed by a two-step organic extraction process whereby yttrium and heavy rare earths having atomic number 65 and 67 are first separated from heavy rare earths having atomic numbers 68 through 71 and after stripping and a second extraction, a dilute mineral acid is used to strip heavy rare earths, atomic numbers 65 through 67, from the yttrium-bearing organic and purified yttrium is then recovered by a concentrated mineral acid.

3,702,234

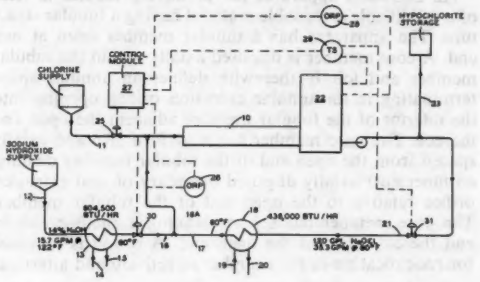
MANUFACTURE OF SODIUM HYPOCHLORITE

Edgar H. Pavia, 610 Poydras St., New Orleans, La. 70112

Filed Mar. 26, 1970, Ser. No. 22,802

Int. Cl. C01b *11/00;* G01n *27/46*

U.S. Cl. 23—86 2 Claims



A method for forming sodiuum hypochlorite at atmospheric conditions from sodium hydroxide and chlorine in proper proportions and under controlled conditions to prevent the escape of unreacted chlorine to the atmosphere; and to avoid the formation of sodium chlorate.

3,702,235

PROCESS FOR THE DETECTION OF HYDROGEN SULFIDE IN DRILL BIT CUTTING

Wayne S. Fallgatter, Tulsa, Okla., assignor to Cities Service Oil Company

No Drawing. Filed June 25, 1971, Ser. No. 157,057

Int. Cl. G01n *31/22, 33/24*

U.S. Cl. 23—230 R 8 Claims

Drill bit cuttings are ground in the presence of a hydroxonium ion, subsequently vacuum filtered and rinsed with distilled water in order to provide a filtrate. The filtrate is introduced into a flask containing a zinc powder, utilized in conjunction with hydrogen chloride to provide a sweep gas of hydrogen, in order to evolve hydrogen sulfide which is then qualitatively and quantitatively detected. The process allows testing of cuttings of water or oil base muds to yield accurate determinations of amount of hydrogen sulfide originally present in the drill bit cuttings.

3,702,236

CATALYTIC CONVERTER

Leroy E. Fessler, Bartlett, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

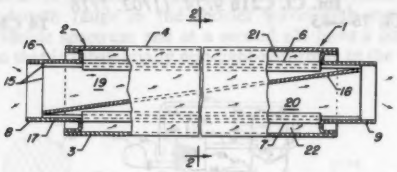
Filed Feb. 19, 1971, Ser. No. 116,773

Int. Cl. F01n *3/14;* B01j *9/04*

U.S. Cl. 23—288 F 6 Claims

A catalytic converter for treating an engine exhaust stream which embodies a pair of passageways disposed

along the free side of the catalyst compartment within an outer housing. The passageways communicate with manifold compartments formed between the housing and



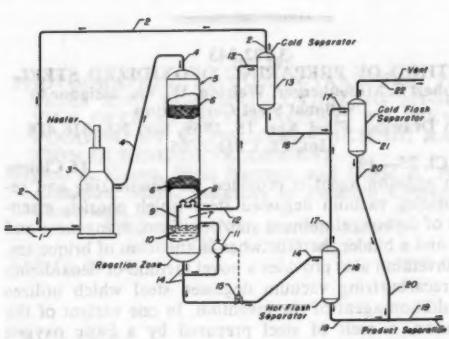
the perforated partitions which form the catalyst compartment, over substantially the total length of each passageway.

3,702,237

HYDROCARBON CONVERSION APPARATUS

Charles H. Watkins, Arlington Heights, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed July 2, 1970, Ser. No. 51,900
Int. Cl. B01j *9/04*
U.S. Cl. 23—288 R **1 Claim**



A hydrocarbon conversion apparatus or vessel for use in mixed-phase, fixed-bed catalytic systems. The vessel is equipped with an internal vapor-liquid separation compartment from which a principally vaporous phase is removed. Removal of this vaporous phase significantly inhibits foaming in the outlet line through which the product effluent is withdrawn.

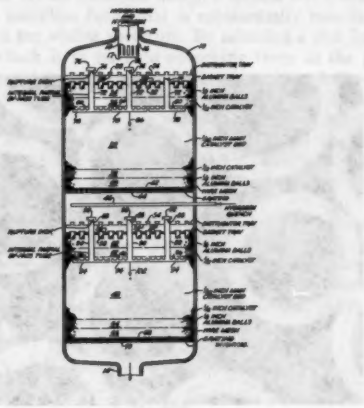
3,702,238

APPARATUS FOR BY-PASSING REACTANTS TO THE INTERIOR OF A CATALYST BED

John M. Armistead, Bethel Park, Pa., and Joseph K. Kosiba, Port Arthur, Tex., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Mar. 18, 1970, Ser. No. 20,744
Int. Cl. B01j *9/04*; C10g *23/02*
U.S. Cl. 23—288 R **6 Claims**

An apparatus for reactant by-pass of an encrusted layer at the top of a catalyst bed. A normally closed conduit extends from the upstream end of the bed to the interior of the bed near the top thereof. A flow direction reversal occurs at the discharge of the conduit. An increase in pressure drop induces opening of the conduit whereupon reactants surge against the underside of the crust forma-



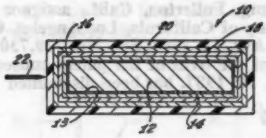
tion so that reactant flow tends to unwedge deposits forming the crust.

3,702,239

MAGNETIC STORAGE MEDIUM

Stanley S. Nagy, Studio City, and Floyd B. Humphrey, Pasadena, Calif., assignors to Sperry Rand Corporation

Filed Mar. 17, 1969, Ser. No. 807,899
Int. Cl. G11b *5/00*; C23b *5/50*
U.S. Cl. 29—195 **18 Claims**



A magnetizable storage member is formed from a substrate and thin layers deposited on the substrate. The first thin layer includes an element such as nickel having hard properties. A thin chemically inert layer such as gold may be disposed on the first thin layer. A third very thin layer of cobalt is disposed on the gold layer or directly on the first thin layer. The cobalt has a higher thickness when the storage member is to record and reproduce digital information. The cobalt has a decreased thickness when the storage member is to record and reproduce analog information having relatively high frequencies such as color information for a television receiver. A hard, thin, nonmagnetic protective coating such as silicone may be disposed on the storage member and may be made from a silicone.

3,702,240

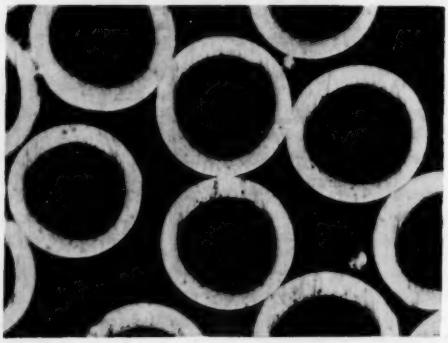
METHOD OF MAKING IMPACT RESISTANT INORGANIC COMPOSITES

August C. Siefert, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation

Continuation-in-part of abandoned application Ser. No. 820,015, Apr. 28, 1969. This application Mar. 4, 1971, Ser. No. 120,932
Int. Cl. C03c *23/20*
U.S. Cl. 65—4 **10 Claims**

A method of making an impact resistant composite comprising: coating glass fibers with metal, and solidify-

ing a matrix of glass around the metal coated glass fibers. The coating has a thickness between 0.00005 and 0.001 inch, the fibers are arranged in a generally parallel manner in which the fibers occupy from approximately 20 to 70 percent of the volume and the glass has a softening point below the melting point of the metal coating.



3,702,241

PESTICIDE COMPOSITIONS CONTAINING DICARBADODECAHYDROUNDECABORATES

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 11, 1968, Ser. No. 720,730
The portion of the term of the patent subsequent to Nov. 10, 1987, has been disclaimed
Int. Cl. A01n 9/00
U.S. Cl. 71—79 **10 Claims**

Pesticidal compositions containing an inert pesticidal carrier and an effective amount of an active toxicant comprising dicarbadodecahydroundecaboric acid or its alkali metal or ammonium salts, wherein the active ingredient is the dicarbadodecahydroundecaborate anion having the following empirical formula:

$$[(BX)_m(BR_1)_nCR_2CR_3]^{-1}$$

wherein:

X is halogen or hydrogen;
R_1 has from 1 to 10 carbon and is alkyl, aryl, alkenyl or halo or carboxy derivatives thereof;
R_2 and R_3 are halogen, hydrogen or alkyl, aryl, alkenyl, carboxyl or cycloalkyl having from 1 to about 10 carbons;
n is 0, 1 or 2; and
$m+n=9$.

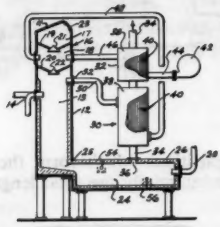
The pesticides are active for a variety of biocidal purposes, e.g., as post- and pre-emergence herbicides, as fungicides, as insecticides and as bactericides.

3,702,242

DOWNDRAFT CUPOLA INCORPORATING MEANS TO PREHEAT THE CHARGE

John Henry Fernandes, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed July 21, 1971, Ser. No. 164,730
Int. Cl. C21b 9/14, 11/02, 7/18
U.S. Cl. 75—43 **14 Claims**



A downdraft cupola organization is disclosed in which means are provided to preheat the charge to the cupola in order to stabilize the level of ignition of the coke bed within the cupola furnace. The charge is preheated by air raised to an elevated temperature by indirect heat exchange with the effluent gas from the cupola. The same air used to preheat the charge is reheated and employed as blast air within the cupola furnace.

3,702,243

METHOD OF PREPARING DEOXIDIZED STEEL

Robert S. Miltenberger, Weirton, W. Va., assignor to National Steel Corporation

No Drawing. Filed Apr. 15, 1969, Ser. No. 816,418
Int. Cl. C21c 7/06
U.S. Cl. 75—49 **16 Claims**

An addition agent is provided for deoxidizing and recarburizing vacuum degassed steel which consists essentially of carbon, aluminum and/or silicon, manganese and iron, and a binder therefor when in the form of briquettes. The invention also provides a novel method of deoxidizing and recarburizing vacuum degassed steel which utilizes the addition agent of the invention. In one variant of the invention, a melt of steel prepared by a basic oxygen process is vacuum degassed and then deoxidized and recarburized with the addition agent of the invention to produce molten killed steel having an ultra low oxygen content which may be continuously cast to produce steel shapes with properties similar to rimmed steel.

3,702,244

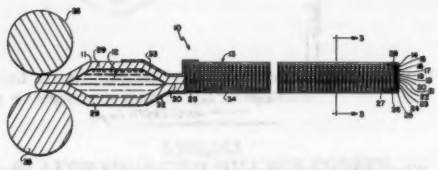
DIFFUSION TRANSFER PHOTOGRAPHIC PROCESSES AND ELEMENTS UTILIZING pH-SENSITIVE AGENTS TO PREVENT FOGGING BY EXTRANEOUS ACTINIC RADIATION DURING DEVELOPMENT

Stanley M. Bloom, Waban, Alan L. Borror, Arlington, and Paul S. Huyffer and Paul T. MacGregor, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 21, 1971, Ser. No. 108,260
Int. Cl. G03c 7/00, 5/54, 1/40
U.S. Cl. 96—3 **159 Claims**

This invention relates to photography, and more particularly, it relates to the use of certain indicator dyes derived from indoles as optical filter agents to protect a selectively exposed photosensitive material from post-exposure fogging in photographic processes where development of the photosensitive material is conducted in the

presence of extraneous incident light. These indicator dyes contain an indole radical, a second aromatic radical and a ring-closing moiety bonded to the aromatic radical and to the 2- or 3-position of the indole radical. At a first pH they have a highly colored, light-absorbing form capable of absorbing radiation within a predetermined wavelength range in the shorter wavelength region of the visible spectrum and at a second pH have a colorless form that is substantially non-light-absorbing in the visible



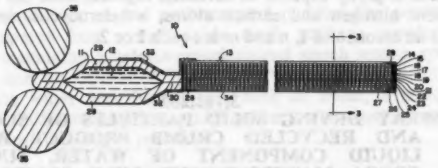
spectrum. By selecting a dye from this class which is in its light-absorbing form at the pH at which development is performed, protection of the exposed photosensitive material from radiation actinic thereto is afforded within the wavelength range absorbed by the dye and subsequent to at least the initial stages of development, the dye may be rendered substantially colorless by adjusting the pH to permit viewing of the final image.

3,702,245

PHOTOGRAPHIC DIFFUSION-TRANSFER PROCESSES AND ELEMENTS UTILIZING pH-SENSITIVE OPTICAL FILTER AGENTS TO PREVENT FOGGING BY EXTRANEOUS ACTINIC RADIATION DURING DEVELOPMENT

Myron S. Simon, West Newton, and David P. Waller, Arlington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 4, 1971, Ser. No. 103,392
Int. Cl. G03c *5/54, 7/00, 1/40*
U.S. Cl. 96—3 **103 Claims**



This invention relates to photography, and more particularly, it relates to the use of certain indicator dyes derived from phenols as optical filter agents to protect a selectively exposed photosensitive material from post-exposure fogging in photographic processes where development of the photosensitive material is conducted in the presence of extraneous incident light. This class of phenol indicator dyes contain a ring-closing moiety bonded to two hydroxy-substituted carbocyclic aryl radicals selected from two p-hydroxyphenyl radicals each possessing a hydrogen-bonding group adjacent to the p-hydroxy group and two p-hydroxynaphthyl radicals at least one of the p-hydroxynaphthyl radicals possessing a hydrogen-bonding group adjacent to the p-hydroxy group. At a first pH in alkaline solution they have a highly colored, light-absorbing form capable of absorbing radiation within a predetermined wavelength range in the longer wavelength region of the visible spectrum and at a second less alkaline pH have a colorless form that is substantially non-light-absorbing in the visible spectrum. By selecting a dye from this class which is in its light-absorbing form at the pH at which development is performed, protection of the exposed photosensitive material from radiation actinic thereto is afforded within the wavelength range absorbed by the dye and subsequent to at least the initial stages of development, the dye may be rendered substantially colorless by adjsting the pH to permit viewing of the final image.

In a preferred embodiment, the phenol dye or dyes are used in conjunction with a second dye or dyes having a principal absorption in at least a partially different wavelength range, and the phenol dye(s) and second dye(s) together afford protection over the wavelength range of about 400 nm. to 700 nm.

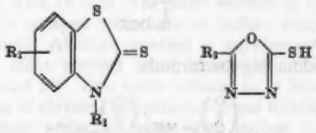
3,702,246

DIFFUSION TRANSFER PROCESS

Yasushi Ohyama, Takatsuki, and Kiyoshi Futaki and Senji Tosa, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

No Drawing. Filed Apr. 15, 1970, Ser. No. 28,989
Claims priority, application Japan, Apr. 16, 1969, 44/29,042
Int. Cl. G03c *5/52*
U.S. Cl. 96—29 R **10 Claims**

In a silver complex diffusion transfer process, an improved pure black color tone and rapid transferability are simultaneously attained by carrying out the development in the presence of toners, selected from combinations of at least one of 3-alkylbenzothiazoline-2-thione derivatives (A) and at least one of 2-mercapto-1,3,4-oxadiazole derivatives (B),



(A) (B)

wherein R_1 is an alkyl group having not more than 5, R_2 is hydrogen, alkyl group having not more than 3 carbon atoms or alkoxy group having not more than 3 carbon atoms, and R_3 is an alkyl group having not more than 8 carbon atoms, aryl or substituted aryl group.

3,702,247

COLOR PHOTOGRAPHIC PROCESS USING A BLEACH-FIX SOLUTION CONTAINING A SELENOSULFATE

Alun Trefor Rhys Williams and David Gerald Alcock, Ilford, England, assignors to Ilford Limited, Ilford, Essex, England

No Drawing. Filed Jan. 12, 1971, Ser. No. 105,955
Claims priority, application Great Britain, Jan. 13, 1970, 1,616/70
Int. Cl. G03c *7/00*
U.S. Cl. 96—55 **9 Claims**

This application describes a colour development process for colour silver halide photographic material, wherein the material after development is treated with a bleach-fix solution which contains a mild oxidising agent, a silver halide solvent and as a bleach-fix accelerator a water-soluble specified selenosulfate.

3,702,248

BLEACH-FIX ADDITIVES

David Gerald Alcock, John Colin Brown, Enzo Piccotti, and Norman John Iungius, Ilford, England, assignors to Ilford Limited, Ilford, Essex, England

No Drawing. Filed Dec. 22, 1970, Ser. No. 100,839
Claims priority, application Great Britain, Dec. 23, 1969, 62,680/69
Int. Cl. G03c 7/16
U.S. Cl. 96—22 14 Claims

This application describes a bleach-fix bath for use in processing colour photographic material comprising a mild oxidising agent, a silver-halide solvent and a bleach-fix accelerator which is a water soluble selenium compound selected from defined classes of selenosemi-carbazides and analogous bis-compounds, 1,2,4-triazole-3-selenols and 5,5-bis, 1,2,4-triazole-3-selenols, the invention including the baths per se and their use in colour processing of photographic material.

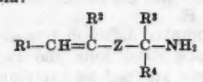
3,702,249

PHOTOGRAPHIC ELEMENT COMPRISING AMINE-CONTAINING POLYMERS

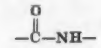
Wayne A. Bowman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 3, 1970, Ser. No. 60,709
Int. Cl. G03c 1/04
U.S. Cl. 96—84 R 5 Claims

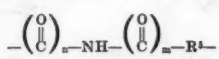
New addition homo- or copolymerizable ethylenically unsaturated monomers containing primary amino groups which do not enter into or interfere with the polymerization of the formula:



where R^1 is hydrogen or carboxyl; R^2 is hydrogen, methyl or ethyl; each of R^3 and R^4 is an alkyl group of 1 to 12 carbon atoms; and Z is a divalent group containing at least one



group and having the formula



where each of *n* and *m* is 0 or 1, and *n* is 0 when *m* is 1 and *m* is 0 when *n* is 1, and R^5 is a divalent organic material selected from the group consisting of alkylene of 1 to 20 carbon atoms, azaoxoalkylene of 2 to 20 carbon atoms, cycloalkylene of 5 to 14 carbon atoms, and alkylenecarbamoylphenylene with the alkylene group containing 1 to 20 carbon atoms, and the acid addition salts thereof, are produced by reaction of an ethylenically unsaturated carboxylic anhydride or N-alkenyl dicarboximide with the corresponding diamine. The homo- and copolymers of these monomers are useful in photography.

3,702,250

DIAZO COATING SOLUTIONS

Walker F. Hunter, Hilton, and John M. McCabe, Pittsford, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 679,234, Oct. 30, 1967. This application May 4, 1970, Ser. No. 34,540
Int. Cl. C23f 11/04, 11/08; G03c 1/60
U.S. Cl. 96—91 R 7 Claims

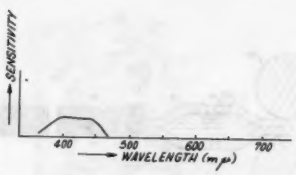
The corrosive effect that diazo salt solutions exhibit on metallic surfaces is found to be substantially retarded by the incorporation of small amounts of propylene oxide and/or nitrite ions in the diazo solutions.

3,702,251

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION FOR MICROFILM USE

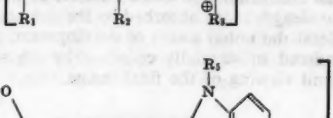
Shui Sato, Kaiichiro Sakazume, and Tsuneo Suga, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1968, Ser. No. 782,169
Int. Cl. G03c 1/14
U.S. Cl. 96—124 6 Claims

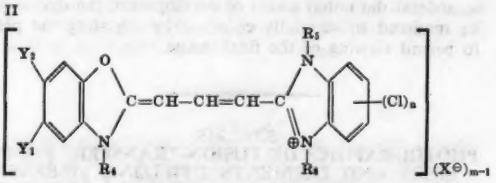


Silver halide photographic emulsions for microfilm use are sensitized by incorporating thereinto, two or more dyes of the Formula (I) and one compound of the Formula (II) in combination:

(I)



II



wherein R_1, R_3, R_4 and R_6 are independently selected from the group consisting of lower alkyl group, a carboxyalkyl group or a sulfoalkyl group, with the proviso that at least one of R_1, R_3, R_4 and R_6 is a carboxyalkyl, sulfoalkyl or sulfalkoxyalkyl group; R_2 is hydrogen atom or a lower alkyl group; R_5 is a lower alkyl group; Y is hydrogen atom, chlorine atom, a lower alkyl group or a lower alkoxy group; Y_2 is hydrogen atom or a lower alkyl group with the proviso that when Y_1 is chlorine, Y_2 is methyl; Z is a group capable of forming, together with the adjacent nitrogen and carbon atoms, a heterocyclic ring; X is an anion; and 1, *n* and *m* are each 1 or 2.

3,702,252

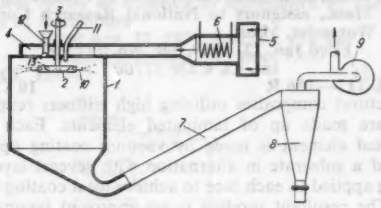
SPRAY DRYING SOLID PARTICLES OF SUGAR AND RECYCLED CRUMB PRODUCT WITH LIQUID COMPONENT OF WATER, SUGAR COCOA MATERIAL, AND MILK SOLIDS TO PRODUCE CHOCOLATE CRUMB

Preston Leonard Veltman, Clarksville, Md., and Herman van Brederode and Johannes C. J. Verdonk, Koog-Zaandijk, Netherlands, assignors to N.V. Cocoafabriek de Zaan, Koog-Zaandijk, Netherlands

Filed July 7, 1970, Ser. No. 53,029
Int. Cl. A23g 1/00
U.S. Cl. 99—23 14 Claims

A process for preparing chocolate crumb, especially milk chocolate crumb, by forming the ingredients (for example sugar and cocoa butter, together with milk solids when making white or milk chocolate or with the cocoa butter in the form of cocoa liquor when making sweet or milk chocolate) into separate liquid and solid phases, and spray drying the liquid phase onto the solid phase, preferably in a centrifugal type spray drier. The spray dried product crumb is removed from the spraying zone by a current of heated air. Some of the crumb produced

is preferably recycled as the solid phase. The solid phase may therefore include micro fine particles of sugar and



recycled crumb product while the liquid phase may include water, cocoa butter, and milk solids.

3,702,253

FLAVOR MODIFIED SOLUBLE COFFEE

Max Winter, Geneva, Fritz Gautschi, Vaud, and Ivon Flament and Max Stoll, Geneva, Switzerland, and Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

No Drawing. Continuation of application Ser. No. 543,069, Apr. 18, 1966, which is a continuation-in-part of application Ser. No. 452,342, Apr. 30, 1965. This application Sept. 8, 1970, Ser. No. 70,560

Int. Cl. A23f *1/04, 1/08, 1/26*

U.S. Cl. 99—71 **1 Claim**

Enhancement of coffee flavor in a soluble coffee composition is achieved by addition of a small but effective amount of one or more compounds taken from pyrazine sulfur compounds, pyradine sulfur compounds, furan sulfur compounds, phenol and phenol ether compounds, and furan ether compounds.

3,702,254

MULTILAYERED STARCH-CONTAINING DESSERT

Robert R. Cassanelli, Yorktown Heights, Ronald P. Wauters, Vails Gate, and Anastasia C. Wirchansky, Yonkers, N.Y., and Clement R. Wyss, Park Ridge, N.J., assignors to General Foods Corporation, White Plains, N.Y.

No Drawing. Filed May 20, 1970, Ser. No. 39,854

Int. Cl. A23l *1/04, 1/14*

U.S. Cl. 99—139 **6 Claims**

A multilayered and multitextured pudding-like dessert is prepared from a shelf-stable, single package, powdery mix containing a gelatin-pregelatinized starch setting system and an emulsified fat system. When whipped with boiling water and diluted with milk or water, a multilayered dessert, having a pudding-like texture bottom and a creamy topping, is produced.

3,702,255

KYNURENINE DERIVATIVES AS SWEETENING AGENTS

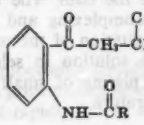
John W. Finley, Walnut Creek, Calif., assignor to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Aug. 21, 1970, Ser. No. 66,083

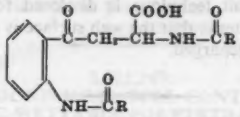
Int. Cl. A23l *1/26*

U.S. Cl. 99—141 A **8 Claims**

Edible materials, particularly food products, are sweetened by the incorporation of a kynurenine derivative responding to either of the following formulas:



wherein R is H or lower alkyl.



wherein each R is H or lower alkyl.

3,702,256

MARINE ANTIFOULING ADDITIVE

Louis M. Stevens, Ruskin, Fla., assignor to L. M. Stevens Corporation, Ruskin, Fla.

No Drawing. Filed Apr. 26, 1971, Ser. No. 137,709

Int. Cl. C09d *5/14, 5/16*

U.S. Cl. 106—15 AF **2 Claims**

A marine anti-fouling additive to enhance an existent anti-fouling paint formulation or to make an existent paint formulation anti-fouling consisting of said paint formulation and 30% to 60% by weight of copper naphthenate and 0.5% to 5.0% by weight of formaldehyde.

3,702,257

MANUFACTURE OF LIGHTWEIGHT AGGREGATE

Ely Koning, 21 Aletta Court, Celliers St., Sunnyside, Pretoria, Transvaal, Republic of South Africa

Continuation-in-part of application Ser. No. 726,601, May 3, 1968. This application Mar. 31, 1970, Ser. No. 24,086

Claims priority, application South Africa, Apr. 3, 1969, 69/2,389; May 30, 1969, 69/3,894

Int. Cl. C08h *17/06*

U.S. Cl. 106—288 B **2 Claims**

Lightweight aggregate is manufactured by pelletizing fly ash. A binder is used comprising an oil in water emulsion with emulsifying agent. Heavy fuel oil is preferred and molasses can be added. Emulsifying agent is a cationic amine with an acid. The outer surface of the pellets is preferably sprayed with fuel oil before subjecting to heat treatment. Alumina content is supplemented to at least 20%, silica content to at least 40%, carbon content to at least 5%, iron oxide content to at least 3%, to form mullite at elevated temperature. Heat treatment preferably includes an initial stage when carbon is burnt, a second stage when sintering occurs with formation of mullite and a third stage when stress relieving occurs.

3,702,258

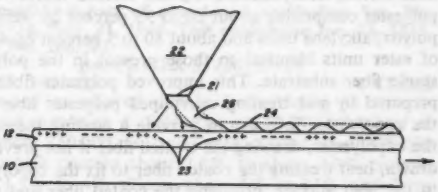
WEB TREATMENT METHOD

Carl B. Gibbons and William C. Kerr, Rochester, and Roger H. Maddocks, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 5, 1969, Ser. No. 804,470

Int. Cl. B44d *1/12;* **G03c** *1/74*

U.S. Cl. 117—34 **4 Claims**



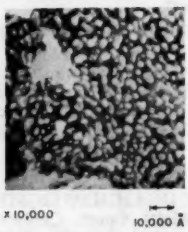
A web with a plastic surface is disclosed as being exposed to an A.C.-produced corona thereby to increase

its printability and coatability. As a result of such treatment the web surface undesirably acquires patterns of charge. A circuit technique is disclosed for so erasing such charge patterns that the web surface is assuredly left substantially uncharged.

3,702,259
CHEMICAL PRODUCTION OF METALLIC SILVER DEPOSITS

Robert P. Nielsen, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.

Filed Dec. 2, 1970, Ser. No. 94,366
Int. Cl. B01j *11/20*
U.S. Cl. 117—37 R **10 Claims**



Deposits of metallic silver are produced on surfaces of solid objects in the form of uniquely uniform, adherent, fine particles by coating the surfaces of the objects with a solution containing a silver salt of a carboxylic acid and certain organic amine solubilizing/reducing agents, such as mixtures of ethylenediamine and ethanolamine. The coated object is then heated to dry the coating and to reduce the silver present in the coating to metallic silver. In one application, this invention is used to chemically produce metallic silver deposits uniformly on interior and exterior surfaces of porous bodies, especially porous refractory catalyst supports. These supported silver products are effective as catalysts for the direct partial oxidation of ethylene to ethylene oxide.

3,702,260
COATED POLYESTER FIBERFILL

Clarence V. Jayne, Gazie K. Ragep, and James D. Templeton, Durham, N.C., assignors to Beaumit Corporation, New York, N.Y.

No Drawing. Filed Jan. 18, 1971, Ser. No. 107,463
Int. Cl. B44d *5/00;* **D02** *1/00*
U.S. Cl. 117—100 C **4 Claims**

Polyester fiberfill having improved compressional recovery is provided comprising crimped polyester staple fiber having cocrystallized on the surface thereof a copolyester comprising about 20 to 95 percent by weight of polyoxyalkylene units and about 80 to 5 percent by weight of ester units identical to those present in the polyester staple fiber substrate. This improved polyester fiberfill is prepared by wet treating uncrimped polyester fiber with the copolyester in order to provide a coating thereon of the copolyester, drawing the treated fiber if not previously drawn, heat treating the coated fiber to fix the copolyester to the fiber surface, crimping the coated fiber and thereafter processing the coated crimped fiber into fiberfill by conventional methods for use as a filler for articles of manufacture, such as pillows, upholstery and the like.

3,702,261
METHOD OF PROVIDING SUBSTRATES WITH STIFF REINFORCING MATERIAL

Frank Feakes, Lexington, and Gabriel E. Padawer, Brookline, Mass., assignors to National Research Corporation, Worcester, Mass.

Filed Jan. 22, 1969, Ser. No. 792,969
Int. Cl. C23c *11/00*
U.S. Cl. 117—106 R **10 Claims**

Structural composites utilizing high stiffness reinforcement are made up of laminated elements. Each basic laminated element is made by vacuum coating opposed faces of a substrate in alternation with several layers of coating applied to each face to achieve total coating thickness. The resultant product is an improved laminate of flat, high strength reinforcing layers of uniform thickness.

3,702,262
CORROSION PROTECTION OF BURIED METAL OBJECTS

William Harry Culver, Bryan, Tex., assignor to Pennsalt Chemicals Corporation, Philadelphia, Pa.

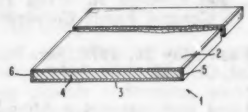
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,403
Int. Cl. C23f *15/00*
U.S. Cl. 117—121 **8 Claims**

Ferrous metal objects, e.g., tanks and pipe, are wrapped in flexible wrapping material that is coated or impregnated with calcium arsenate to protect the metal from corrosion when buried in the soil.

3,702,263
PROCESS FOR ELECTROLESSLY PLATING MAGNETIC THIN FILMS

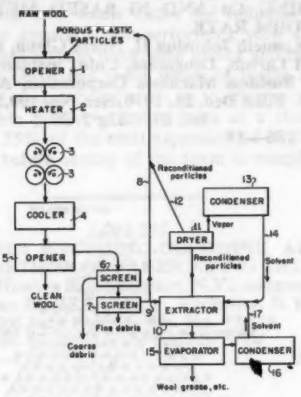
David W. Hall, Poughkeepsie, John A. Lindholm, Newburgh, Lubomyr T. Romankiw, Millwood, and Arnold F. Schmeckenbecher, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of abandoned application Ser. No. 634,531, Apr. 28, 1967. This application Feb. 20, 1970, Ser. No. 13,233
Int. Cl. H01f *10/00*
U.S. Cl. 117—240 **2 Claims**



A process for electrolessly plating substrates with thin films of magnetic material which is carried out in a temperature range which includes room temperature. The process includes the immersion of a substrate in an aqueous solution which contains iron ions and at least another metal ion such as nickel, which upon deposition form the magnetic material. A reducing agent such as sodium hypophosphite is provided in the bath in an amount sufficient to cause deposition of the metals in small grain sizes. Sufficient hydroxyl ions are also provided to maintain the bath in conditions which range from slightly acidic to highly alkaline. The bath is then maintained in a temperature range which includes room temperature over which range thin films having a characteristic silvery finish indicative of small grain size are produced. The process also includes the step of aging a ferrous bath for a period of time sufficient to convert the ferrous ions to stabilize the bath. The above-mentioned constituents and other complexing and buffering agents which prevent the precipitation of the metals from solution are present in the solution in selected concentrations which permit the plating of small grain size magnetic films at low temperature.

3,702,264
PROCESS FOR CLEANING WOOL
George H. Robertson, Albany, Calif., assignor to the United States of America as represented by the Secretary of Agriculture
Filed Apr. 12, 1971, Ser. No. 132,948
Int. Cl. D06g *1/00*; D06l *1/00*
U.S. Cl. 134—7 12 Claims

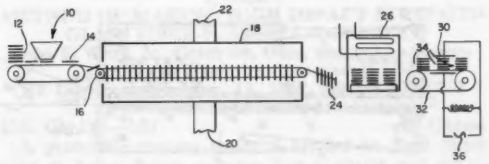


Grease, suint, and other impurities are removed from raw wool by a novel procedure. Example: Raw wool is opened, commingled with particles of a plastic foam, heated, pressed, and the resulting clean wool separated from the plastic particles containing absorbed impurities.

3,702,265
LEAD-ACID STORAGE BATTERY PASTE
Richard N. Snyder, Anderson, and Ellis G. Wheadon, Yorktown, Ind., assignors to General Motors Corporation, Detroit, Mich.
No Drawing. Filed June 25, 1971, Ser. No. 157,003
Int. Cl. H01m *39/00*
U.S. Cl. 136—26 5 Claims

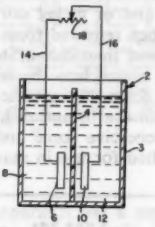
Lead-acid storage battery paste containing battery makers lead oxides, a first bulking agent such as carboxymethylcellulose, and less than about 4% by weight of a second bulking agent comprising hollow, multicellular, siliceous amorphous globules having friable walls.

3,702,266
METHOD FOR PROCESSING PASTED LEAD ACID BATTERY PLATES
Joseph C. Duddy, Trevose, Pa., assignor to ESB Incorporated
Filed Nov. 12, 1970, Ser. No. 88,945
Int. Cl. H01m *35/26*
U.S. Cl. 136—33 14 Claims



A method for processing freshly pasted lead acid storage battery plates prior to formation is described in which the plates are first rapidly frozen by exposure to sub-zero temperatures and then warmed, preferably by exposure to high frequency radiation. The plates may be stored for any length of time in the frozen state.

3,702,267
ELECTROCHEMICAL CELL CONTAINING A WATER-WETTABLE POLYTETRAFLUOROETHYLENE SEPARATOR
Walter Gustav Grot, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed June 15, 1970, Ser. No. 46,289
Int. Cl. H01m *3/02*
U.S. Cl. 136—146 5 Claims



Polytetrafluoroethylene is provided containing from 20 to 95% by weight of inorganic particulate solids which are characterized by a particle diameter of no greater than 0.2 micron, a bulk density no greater than of 0.25 gm./cm.^{3}, and a specific surface area of at least 20 m.^{2}/gm. The particulate solids impart a high degree of microporosity and wettability which makes the polymer useful as a filter or as an ion permeable separator in electrochemical cells.

3,702,268
SAW BLADE STEEL AND SAW BLADES OR SAW-BLADE STRIP MADE THEREFROM
Klas-Erik Jakenberg, Hagfors, Sweden, assignor to Uddeholms Aktiebolag, Hagfors, Sweden
Filed May 23, 1969, Ser. No. 827,279
Claims priority, application Sweden, May 31, 1968, 7,334/68
Int. Cl. C21d *7/00*, *9/24*
U.S. Cl. 148—12 15 Claims

There is provided a steel for making saw blades, and a saw blade made from the steel. The steel having an analysis of up to 20% Cr, 0.2–1.5% C, and a maximum of 6% additional alloying elements and being such that it has a ferrite matrix in the temperature range of 550–790° C., and in which range the steel in a ferritic state has been rolled to a total area reduction of at least 60%.

3,702,269
ULTRA HIGH STRENGTH DUCTILE IRON
Nathan Lewis Church, Warwick, N.Y., assignor to The International Nickel Company, Inc., New York, N.Y.
Continuation-in-part of abandoned application Ser. No. 878,938, Nov. 21, 1969. This application Jan. 22, 1971, Ser. No. 108,702
Int. Cl. C22c *37/00*, *37/04*
U.S. Cl. 148—35 4 Claims

Directed to alloyed ductile irons having in the as-tempered condition a yield strength (0.2% offset) of at least about 150,000 p.s.i., and even at least about 170,000 p.s.i., which contain about 2.6% to about 4.0% carbon, about 1.5% to 4% silicon, about 6% to 11% nickel, up to about 7% cobalt, an effective amount of a graphite spheroidizing agent, up to about 1% manganese, up to about 0.4% molybdenum and the balance essentially iron.

3,702,270

METHOD OF MAKING A MAGNETIC POWDER

Meiro Kawasaki, Tokyo, and Shigetaka Higuchi, Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 21, 1971, Ser. No. 154,949
Claims priority, application Japan, June 23, 1970, 45/54,581
Int. Cl. H01f 1/22
U.S. Cl. 148—105 9 Claims

A method of preparing powders having improved magnetic properties for use in the manufacture of recording tapes is shown. A colloidal suspension of iron oxide is formed. A solution of a salt of cobalt and/or nickel is added to the colloidal suspension and the mixture is agitated and the pH thereof controlled to facilitate absorption of the cobalt and/or nickel salts on the iron oxide. The iron oxide is then removed from suspension, washed, dried and ground and then dehydrated to uniformly diffuse the cobalt or nickel into the iron oxide. The mass is then reduced to form the metallic alloy. The powders formed according to the invention have substantially increased values of coercive force and magnetization and are particularly suited for use in master video tapes.

3,702,271

AZEOTROPIC REMOVAL OF WATER FROM ORDNANCE

Larry D. Henderson, Bryans Road, and Craig E. Johnson, Indian Head, Md., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Oct. 23, 1970, Ser. No. 83,660
Int. Cl. C06f 11/00
U.S. Cl. 149—38 6 Claims

A process for removing water from explosives and propellants wherein the explosive or propellants are mixed with a liquid hydrocarbon, which exhibits an azeotrope with water, and the resultant azeotrope is volatilized from the remaining composition.

3,702,272

SPHERICAL ROCKET PROPELLANT CASTING GRANULES AND METHOD OF PREPARATION

Thomas F. McDonnell, Collinsville, and Ralph E. Coffee, Alton, Ill., assignors to Olin Mathieson Chemical Corporation

No Drawing. Continuation-in-part of application Ser. No. 176,424, Feb. 28, 1962. This application Jan. 10, 1964, Ser. No. 337,099
Int. Cl. C06d 5/00
U.S. Cl. 149—19 36 Claims

1. A process for preparing spherical rocket propellant casting granules which comprises admixing a lacquer of nitrocellulose in a volatile solvent therefor with an aqueous slurry of finely divided particles of a sensitive solid which is substantially insoluble in said volatile solvent, said sensitive solid being selected from the group consisting of a crystalline high explosive composition, a metal fuel for solid propellants, and mixtures thereof, agitating the resulting mixture to yield an aqueous suspension of spherical globules of the lacquer having said particles dispersed therein, evaporating a sufficient proportion of said volatile solvent to effect partial solidification of said globules, admixing a dewatering agent with the resulting aqueous suspension of partially solidified globules, evaporating the remainder of the solvent from the globules, whereby solid spherical granules of said particles firmly embedded in a matrix of nitrocellulose are formed from said partially solidified globules, washing said granules with water, and drying said granules.

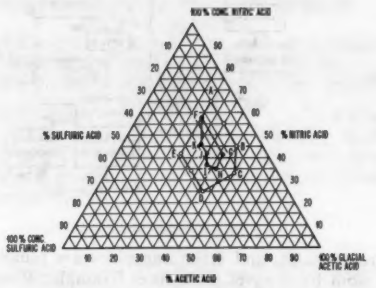
18. A solid rocket propellant grain comprised of spherical propellant casting granules embedded in a cured thermosetting binder, said spherical propellant casting granules being comprised of finely divided particles of a crystalline high explosive compound firmly embedded in a matrix of nitrocellulose, said crystalline high explosive compound being substantially insoluble in a water immiscible solvent for nitrocellulose.

3,702,273

ETCHING COMPOSITIONS AND METHOD FOR ETCHING Cu AND Ni BASED METALS AT A UNIFORM RATE

Harold Kenneth Johnston II, North Glenn, and Theodore Lowell Larson, Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 21, 1970, Ser. No. 100,106
Int. Cl. C23g 1/20
U.S. Cl. 156—18 10 Claims



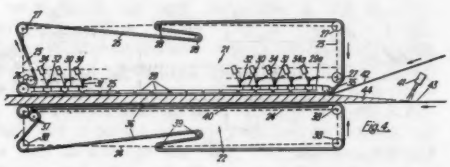
Composite structures of nickel based metals and copper based metals are utilized for example, in magnetic read/write transducers. The surfaces of such structures are normally finished by grinding. However, grinding sometimes tends to smear the different metals over one another, thus, interfering with their desired electrical and magnetic characteristics. In the present invention, smeared dissimilar metals are removed at a substantially uniform rate by etching with compositions including nitric acid, sulfuric acid, and acetic acid in relative percentages by volume lying within the area defined approximately in the accompanying diagram by the solid lines AB, BC, CD, DE, and EA.

3,702,274

PROCESS FOR MAKING RIGID POLYURETHANE FOAM LAMINATE

Alan Metcalf Wooler, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of abandoned application Ser. No. 421,392, Dec. 28, 1964. This application Aug. 4, 1969, Ser. No. 847,227
Int. Cl. B32b 5/18
U.S. Cl. 156—79 8 Claims



Process for continuously manufacturing laminated articles having a plastics or resinous foam core sandwiched between and bonded to two outer sheets of facing

material in which, after the foam-forming ingredients have been applied to the lower sheet and the two sheets are conveyed in parallel disposition with each other whilst the foam layer is formed between them, and subsequently to the occurrence of not less than 75% of the total expansion of the foam layer but before setting is complete, the components of the laminate are subjected to a predetermined yieldable pressure and conveying motion is imparted to the two sheets under the influence of that pressure. Also apparatus for performing such a process which comprises a foam dispensing means and means for conveying the upper and lower sheets of facing material, the conveying means being such as to exert a predetermined yieldable pressure on the foam at a stage when not less than 75% of the total expansion of its foam has occurred but before setting of the foam is complete.

3,702,275

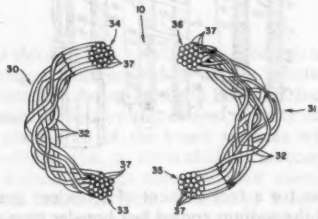
FIBER OPTICS ENCODING-DECODING APPARATUS AND METHOD OF FABRICATING THE SAME

Richard Hooker III, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed June 3, 1970, Ser. No. 43,058

Int. Cl. B65h *81/00;* **G02b** *5/14*

U.S. Cl. 156—174 **5 Claims**



A matched pair of fiber optics image encoding-decoding bundles is fabricated by the steps of coiling a continuous optical fiber into a toroidal or similar shaped bundle of fiber convolutions; securing together a first section of each fiber convolution to form a first portion of the bundle, the remainder of each fiber convolution comprising a second section thereof; scrambling at least one second section of the fiber convolutions; securing together the second section of each fiber convolution so as to form a second portion of the bundle; and transversely cutting each fiber convolution at the first and second portions to effect two bundles with opposed end faces thereof defined by respective ones of the fiber endings. Although the opposite end faces of each bundle are arranged in different geometrical patterns of fiber endings, the corresponding end faces of the pair of bundles are arranged in substantially identical geometrical patterns of fiber endings.

3,702,276

METHOD OF MAKING HIGH IMPACT STRENGTH GLASS FIBER-PLASTIC COMPOSITES

John E. Ward, Jr., Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation

No Drawing. Filed Jan. 13, 1969, Ser. No. 790,859

Int. Cl. B29h *9/04*

U.S. Cl. 156—181 **10 Claims**

A protective coating material applied to glass fibers prior to being drawn together into a strand and which when partially cured gives the strand a high degree of integrity. Organic resins reinforced by the strand have high impact strength. A preferred example of the coating material comprises a copolymer of vinyl acetate and normal methylol acrylamide.

3,702,277

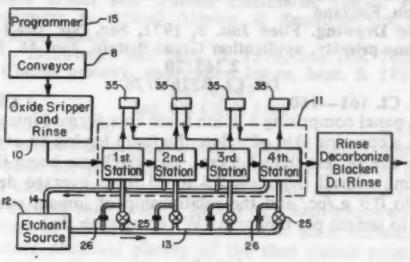
CONTROL SYSTEM FOR MASK ETCHING APPARATUS

Martin L. Lerner, River Forest, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Sept. 23, 1970, Ser. No. 74,760

Int. Cl. C23f *17/00;* **C03c** *15/00;* **B23p** *15/00*

U.S. Cl. 156—345 **3 Claims**



A mask etching apparatus has a succession of etching stations to which etchant is supplied from a common source through a closed circulating distribution system. Measuring devices monitor the etching process by measuring the hole size of the mask in process and develop a control potential through which the duration of the etching time is controlled in the various stations. When no etching is to take place in a given station, a valve to that station is closed but a by-pass permitting a restricted flow of etchant continues circulation through the entire system.

3,702,278

NONSLIP FIBREGLASS SURFACE

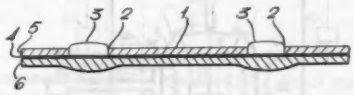
Derek Lionel William Fitzgerald, South Hants Marine, Chandler's Ford, England

Filed Sept. 29, 1970, Ser. No. 76,579

Claims priority, application Great Britain, Sept. 29, 1969, 47,718/69

Int. Cl. B32b *3/10, 3/14, 3/30*

U.S. Cl. 161—5 **4 Claims**



A boat deck of glass-reinforced resin including a gelcoat thereon, grooves in the upper surface filled with strips of antislip material and a wood grain pattern visible through such gelcoat.

3,702,279

FIBROUS THERMAL INSULATION AND METHOD FOR PREPARING SAME

Zane L. Ardary, Kingston, Tenn., and David H. Sturgis, Muskegon, Mich., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Apr. 7, 1971, Ser. No. 132,209

Int. Cl. B32b *17/02;* **C03b** *29/00*

U.S. Cl. 161—170 **9 Claims**

A low-density thermal insulation usable at high temperatures in oxidizing atmospheres is prepared by pulp molding a slurry of inorganic fibers, impregnating the molded fibrous mass with a binder of an inorganic sol,

gelatinizing the sol, curing the gelatinized binder, drying the composite, and thereafter firing the composite for sintering the binder.

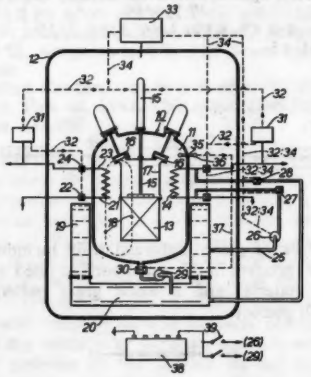
3,702,280
NYLON PANELS
Norman Stewart Anderson, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Jan. 5, 1971, Ser. No. 104,161
Claims priority, application Great Britain, Jan. 16, 1970, 2,245/70
Int. Cl. B32b *3/26*
U.S. Cl. 161—160 **7 Claims**

A panel comprising a nylon foam core formed integrally with a covering skin of nylon, the foam having an average pore size of less than 1.5 cm., skin thickness being 0.2 to 3 mm., overall thickness 2.5 to 25 mm., average density 0.2 to 0.9 g./cc. and the relationship of impact strength (S) to weight per unit area (W) being such that

$$\frac{\log_{10} S}{W} > 2$$

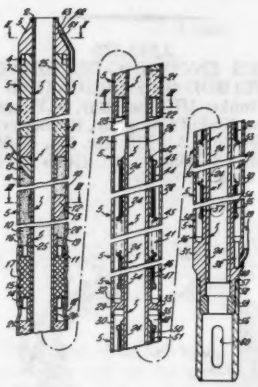
Manufacture of such panels by a two-shot moulding process using a mould of adjustable thickness.

3,702,281
REMOVAL OF HEAT FROM A NUCLEAR REACTOR UNDER EMERGENCY CONDITIONS
Leslie Birts, Knutsford, and Ronald Scott Challender, Warrington, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Jan. 12, 1970, Ser. No. 2,194
Claims priority, application Great Britain, Jan. 16, 1969, 2,708/69
Int. Cl. G21d *3/04*
U.S. Cl. 176—37 **3 Claims**



A P.W.R. with a steam boiler in the same pressure vessel as the reactor core is provided with an emergency water supply which, on detection of a leak in the reactor coolant circuit, can first be connected as feed to the boiler to reduce reactor coolant pressure by abstracting heat and, when the coolant pressure has fallen adequately, can then be connected to the reactor coolant circuit to maintain the core flooded. The feed of the emergency water supply to the boiler and hence the pressure reduction can be carried out with low powered pumps operated from standby electrical supplies and, with the pressure reduced low powered pumps can again be used to maintain the core flooded. The emergency water supply can serve a dual function by being arranged also to act as a shield for the reactor.

3,702,282
NUCLEAR REACTOR FUEL ELEMENTS
John Andrew Gatley, Knutsford, and George Oliver Jackson, Timperley, Cheshire, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Nov. 26, 1968, Ser. No. 779,066
Claims priority, application Great Britain, Dec. 20, 1967, 57,972/67
Int. Cl. G21c *3/18*
U.S. Cl. 176—68 **5 Claims**

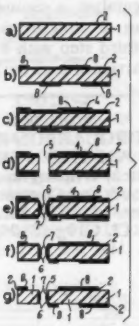


A fuel pin for a fuel element of a nuclear reactor (for example of the sodium cooled fast breeder type) is of the elongate tubular type having its inner and outer sheaths sealingly secured together at one end and at the other end having first and second sealing means in spaced adjacent relationship to one another and each allowing relative longitudinal movement between the two sheaths. A duct provides a vent path to the outside of the fuel pin from the space between the two sheaths and bounded by the two sealing means. The duct is conveniently provided by a capillary tube helically coiled about the outside of the fuel pin and terminating at that end of the fuel pin which is remote from the two sealing means.

3,702,283
PROCESS FOR IMPROVING THE FOOD VALUE OF MICROORGANISMS OBTAINED BY CULTURE ON HYDROCARBON SUBSTRATES
Claude Gatellier, Boulogne, and Georges Gilkmans, Meudon la Foret, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil Malmaison, France
No Drawing. Filed Aug. 24, 1970, Ser. No. 66,561
Claims priority, application France, Sept. 2, 1969, 6929980
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 R **5 Claims**

Microorganisms, for example yeasts, grown on hydrocarbon substrates have a high content of nucleic acids, which makes their use in food objectionable. This invention obviates this problem by providing a process according to which a microorganism previously grown on a hydrocarbon substrate is contacted with oxygen and a multiplication inhibitor specifically carbon dioxide, thereby stopping the multiplication while maintaining substantially unchanged the other life functions of the microorganism cells.

3,702,284
PROCESS OF PRODUCING PLATED THROUGH-HOLE PRINTED CIRCUIT BOARDS
Hans-Hermann Merkenschlager, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Oct. 16, 1969, Ser. No. 866,876
Claims priority, application Germany, Dec. 4, 1968, P 18 12 692.6
Int. Cl. B44d *1/18;* C23b *5/48*
U.S. Cl. 204—15 4 Claims



Plated through-hole printed circuit boards are produced by printing a first resist material (i.e. photoresist) onto appropriate metal-clad laminate board surfaces in a pattern predetermined by the desired circuits and then uniformly coating all of the board surfaces with a second resist material (i.e. a nitrocellulose lacquer) and producing desired through-holes between selected areas of the coated board surfaces. Thereafter a layer of a first metal (i.e. Cu) is applied onto the through-hole walls and on the coated surfaces by a metal-reduction process and such metal layer is then removed from only the coated surfaces and a layer of a second metal (i.e. Au) is electroplated onto metal-receptive hole walls and/or board surfaces. Then the second resist material is removed from the board surfaces and then portions of the metal-clad are removed from the board surfaces in a pattern predetermined by the desired circuits. The electroplating can occur before or after the removal of the second resist material; when occurring before, the second metal is electroplated only on the coated through-hole walls and when occurring after, the second metal is electroplated on the coated through-hole walls and on the metal-clad board surfaces free of resist material.

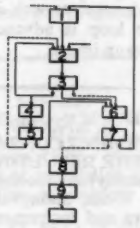
3,702,285
PROCESS FOR THE PRETREATMENT OF PLASTIC FOR THE PURPOSE OF ADHESIVE METALLIZATION
Helmut Knorre, Hainstadt, and Eugen Meyer-Simon, Frankfurt am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Filed July 7, 1969, Ser. No. 839,678
Claims priority, application Germany, July 11, 1968, P 17 69 778.8
Int. Cl. B44d *1/092;* C23b *5/64*
U.S. Cl. 204—30 4 Claims

There is provided a process for the adhesive metallization of plastic surfaces including a chromosulfuric etch and subsequent chemical metallization and electroplating and improvement in which the plastic sample, after the chromosulfuric acid etching, is preferably treated in an aqueous alkaline intermediate bath containing ammonia or a material having, primary, secondary or tertiary amino groups and/or containing a quaternary ammonium compound.

3,702,286
METHOD OF PLATING FOR VINYL CHLORIDE RESINS
Minoru Ichiki and Yutaka Ushimaru, Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
No Drawing. Filed Sept. 8, 1970, Ser. No. 70,525
Claims priority, application Japan, Sept. 5, 1969, 44/70,341
Int. Cl. C23b *5/62*
U.S. Cl. 204—30 4 Claims

A method of plating a vinyl chloride resin comprising the steps of: pre-etching a vinyl chloride resin by means of a solution or an emulsion containing monohydric phenol; etching said resin by means of a highly concentrated mixture of sulfuric acid and chromic acid; subsequently effecting chemical plating of the thus etched resin; and thereafter effecting electro-plating of the chemically plated resin.

3,702,287
PROCESS FOR PRODUCING MANGANESE DIOXIDE FOR DRY CELLS
Hidehisa Yamagishi and Mizuo Tanaka, Kawasaki, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 66,048
Claims priority, application Japan, Aug. 25, 1969, 44/66,556
Int. Cl. B01k *1/00;* C01b *15/04*
U.S. Cl. 204—83 6 Claims



Manganese dioxide is produced by direct current electrolysis of aqueous sulfuric acid solution of manganese sulfate under specified conditions. Mn^{3+} ions are produced and are hydrolyzed with the formation of MnO_2.

3,702,288
PROCESS FOR FINISHING METAL SUBSTRATES BY ELECTRODEPOSITING A PRIMER COMPOSITION AND APPLYING AN ACRYLIC ORGANOSOL COATING COMPOSITION
Anthony J. Erinjeri, Flint, Mich., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Mar. 31, 1971, Ser. No. 129,961
Int. Cl. B01k *5/02;* C23b *13/00*
U.S. Cl. 204—181 17 Claims

The process of this invention for finishing metal comprises the following steps:

(1) Electrodepositing a primer coating of a carboxylic polymer on a metal substrate, washing the coated substrate and baking the coated substrate;

(2) Applying a sealer coat to the primed substrate and then a coating of an acrylic organosol lacquer and

baking the coating to form a smooth, glossy finish having a high quality lacquer appearance.

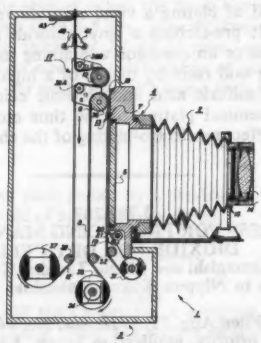
The process is particularly useful for finishing automobile bodies and truck bodies.

3,702,289

PHOTOELECTROPHORETIC PROCESS AND APPARATUS

Raymond K. Egnaczak, Williamson, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1970, Ser. No. 84,831
Int. Cl. B01k *5/02*
U.S. Cl. 204—181 16 Claims



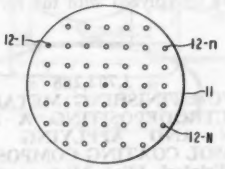
A photoelectrophoretic device includes an imaging roller and transfer roller designed to travel over a film sheet having a rupturable ink pod. A blocking web is laid over the film sheet and picked up by the imaging roller during its travel. A receiver web is looped over a transfer roller and the loop is advanced across the imaged film sheet to pick up an image.

3,702,290

METHOD OF FORMING CONTACTS TO EPITAXIAL GaAs AND THE RESULTING STRUCTURE

Albert Y. C. Yu, Sunnyvale, Howard J. Gopen, Palo Alto, and Robert K. Waits, Sunnyvale, Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Sept. 1, 1970, Ser. No. 68,693
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 9 Claims



Ohmic contacts are formed to epitaxial gallium arsenide by sputtering the contact constituents onto the gallium arsenide surface. By controlling the constituents of the ohmic contact, the temperature at which the ohmic contact alloys with the underlying gallium arsenide is kept beneath the temperature at which the ohmic contact melts. This prevents the formation of islands of contact material on the gallium arsenide surface and thus ensures ohmic contacts with predictable characteristics.

3,702,291

PROCESS FOR SELECTIVELY HYDROGENATING PETROLEUM CUTS OF THE GASOLINE RANGE IN SEVERAL STEPS

Yves Jacquin, Paris, and Michel Derrien, Rueil-Malmaison, France, assignors to Institut Francais du Petrole des Carburants et Lubrifiants, Rueil-Malmaison, France

No Drawing. Filed July 7, 1971, Ser. No. 160,505
Int. Cl. C10g *23/02*
U.S. Cl. 208—57 12 Claims

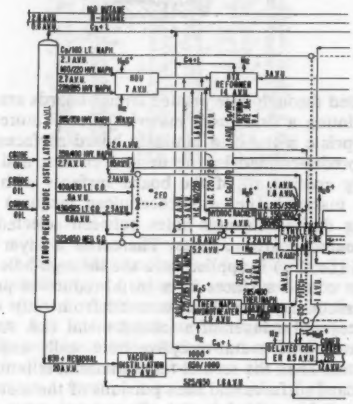
A feedstock of the gasoline range is selectively hydrogenated in three steps; a first step in liquid phase with a Group VIII metal catalyst, a second step in gaseous phase with a molybdenum or tungstn catalyst on a carrier of low surface and a third step with a molybdenum or tungsten catalyst on a carrier of high surface.

3,702,292

COMPOSITE HYDROCARBON REFINERY APPARATUS AND PROCESS ARRANGEMENT

William James Burich, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 10, 1970, Ser. No. 18,179
Int. Cl. C10g *37/06, 37/10*
U.S. Cl. 208—80 24 Claims



A highly integrated crude oil refinery arrangement for producing fuel and chemical products, involving crude oil distillation means, hydrocracking means, delayed coking means, reforming means, ethylene and propylene producing means comprising a pyrolysis steam cracking unit and a pyrolysis products separation unit, catalytic cracking means, aromatic product recovery means, butadiene recovery means and alkylation means in a highly flexible, closely controlled and inter-related system to produce a high conversion of crude oil to chemicals of as high as about 50% and a conversion of crude oil to gasoline and jet fuel as low as about 50% for a maximum value combination of widely varied products.

3,702,293

HYDROCARBON CONVERSION PROCESS WITH A BIMETALLIC CATALYST

John C. Hayes, Palatine, Roy T. Mitsche, Island Lake, Richard E. Rausch, Mundelein, and Frederick C. Wilhelm, Arlington Heights, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Original application May 4, 1970, Ser. No. 34,539. Divided and this application Dec. 30, 1971, Ser. No. 214,396
Int. Cl. C10g *35/08*
U.S. Cl. 208—139 26 Claims

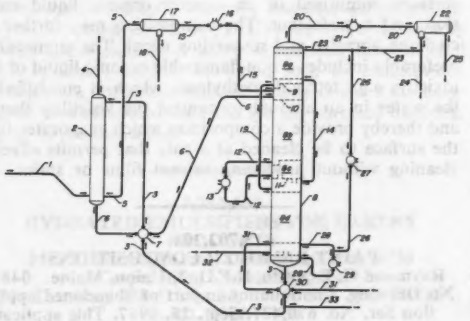
Hydrocarbons are converted by contacting them, at hydrocarbon conversion conditions, with a catalytic com-

posite, comprising a platinum group component and a Group IV–A metallic component combined with a carrier material containing alumina and finely divided, zeolitic crystalline aluminosilicate. A specific example of the hydrocarbon conversion processes disclosed herein is a process for producing LPG and a high octane reformate, which comprises contacting a hydrocarbon charge stock and hydrogen, at LPG production conditions, with a catalytic composite containing 0.01 to 2 wt. percent platinum, 0.1 to 3.5 wt. percent halogen and 0.01 to 5 wt. percent germanium combined with a gamma-alumina carrier material having 0.1 to 20 wt. percent of the hydrogen form of mordenite uniformly distributed therethrough.

3,702,294
TRIMETALLIC HYDROCARBON CONVERSION CATALYST AND USES THEREOF
Richard E. Rausch, Mundelein, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Continuation-in-part of applications Ser. No. 807,910, Mar. 17, 1969, and Ser. No. 819,114, Apr. 24, 1969. This application May 10, 1971, Ser. No. 142,079
Int. Cl. C10g *35/08;* B01j *11/12*
U.S. Cl. 208—139 **23 Claims**

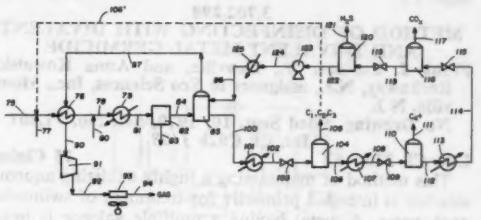
A catalytic composite comprising a combination of a platinum group component, a rhenium component, and a tin component with a porous carrier material is disclosed. The principal utility of this composite is in the conversion of hydrocarbons, particularly in the reforming of a gasoline fraction. A specific example of the disclosed catalytic composite is a combination of a platinum component, a rhenium component, a tin component, and a halogen component with an alumina carrier material in amounts sufficient to result in a composite containing, on an elemental basis, about 0.01 to 2 platinum, about 0.01 to 2 rhenium, about 0.01 to 5 wt. percent tin and about 0.1 to 3.5 wt. percent halogen.

3,702,295
AROMATIC HYDROCARBON RECOVERY METHOD
Herbert Lytle Thompson, Park Ridge, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed May 27, 1971, Ser. No. 147,574
Int. Cl. C10g *21/28;* C07c *7/10*
U.S. Cl. 208—321 **12 Claims**



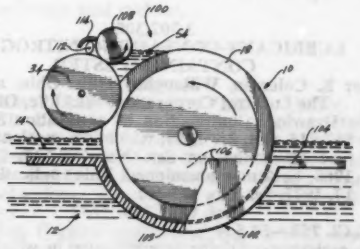
High purity aromatic hydrocarbons are extracted from a mixture of aromatic and non-aromatic hydrocarbons by a combination of solvent extraction, stripping of the aromatic extract and the rectification of a vapor side cut from the aromatic stripping in the presence of a water reflux.

3,702,296
OIL AND GAS TREATMENT
Thomas B. Arnold and Eugene B. Byrnes, Dallas, and Alonzo R. Castoe, Irving, Tex., assignors to Atlantic Richfield Company, New York, N.Y.
Filed Dec. 23, 1970, Ser. No. 100,905
Int. Cl. C10g *5/04*
U.S. Cl. 208—341 **8 Claims**



Methods for treating oil and gas to stabilize the oil by removing the gas and to make the gas meet specifications such as dew point. The oil is stabilized by subjecting same to flash conditions and the extent of flashing is controlled by adding to the oil a more volatilizable material of varying liquid and gas content. The gas is prepared to meet specifications by cooling followed by contacting with at least one solvent which has a greater affinity for heavier hydrocarbons, carbon dioxide, hydrogen sulfide, and water than for methane, ethane, and propane.

3,702,297
OIL SKIMMING DEVICE AND METHOD
John Maksim, Jr., 8165 Cornwall Ave., Etiwanda, Calif. 91739
Continuation-in-part of application Ser. No. 838,600, July 2, 1969. This application Feb. 16, 1970, Ser. No. 11,401
Int. Cl. B01d *15/00*
U.S. Cl. 210—40 **11 Claims**



A method and apparatus for removing crude oil from a body of water includes a sponge-coated collection roll. The ends of the collection roll are supported from floats so that the lower portion of the roll is immersed in the oil,

and a drive mechanism rotates the collection roll to continuously absorb the oil. A downwardly sloping wringer is held tigthly against the lateral surface of the collection roll to deform the collection roll surface and squeeze the oil from the roll. A doctor blade or a roller disposed against the longitudinal surface of the wringer provides an inclined weir for the oil squeezed from the collection roll. The oil flows downwardly into a collection tank located adjacent to the collection roll. An elongated baffle plate below the collection roll limits the amount of water taken up by the collection roll. A worm gear removes grease accumulations trapped by the doctor blade or roller.

3,702,298

METHOD OF DISINFECTING WITH DIVALENT AND TRIVALENT METAL GERMICIDE

Frank J. Zsoldos, Jr., Denville, and Anna Kowalski, Rockaway, N.J., assignors to Eco Sciences, Inc., Montville, N.J.

No Drawing. Filed Sept. 10, 1970, Ser. No. 71,201
Int. Cl. C02b *3/08*
U.S. Cl. 210—62 **15 Claims**

This method of maintaining a highly oxidizing aqueous solution is intended primarily for treatment of swimming pool water. A metal having a multiple valence is interacted to a lower valence with oxidizable debris in the solution, and the metal is continuously re-oxidized to a higher valence by maintaining in the water a constant excess of an oxidizer bank consisting of a salt of a peroxy acid. Silver, copper and nickel are suitable metals and their salts have germicidal properties which are greatly increased and the spectrum broadened by converting the mono salt to a divalent or trivalent salt.

3,702,299

LUBRICATING COMPOSITION

Robert J. Hartle, Gibsonia, and Joseph J. McGrath, Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Nov. 13, 1970, Ser. No. 89,506
Int. Cl. C10m *1/20, 1/32*
U.S. Cl. 252—51.5 R **4 Claims**

A mineral lubricating oil, particularly a hydrogenated mineral lubricating oil is stabilized against photo-deterioration by incorporating therein a small amount sufficient to inhibit such deteroration of each of (1) an ortho-hydroxybenzophenone, e.g., 2,2'-dihydroxy - 4 - methoxybenzophenone and (2) an aliphatic primary amine, e.g., a C_8–C_{18} alkyl amine or mixture of C_8–C_{18} alkyl amines.

3,702,300

LUBRICANT CONTAINING NITROGEN-CONTAINING ESTER

Lester E. Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

No Drawing. Continuation of application Ser. No. 867,915, Oct. 20, 1969, which is a continuation-in-part of application Ser. No. 785,735, Dec. 20, 1968, both now abandoned. This application Mar. 17, 1971, Ser. No. 125,401
Int. Cl. C10m *1/32*
U.S. Cl. 252—51.5 A **10 Claims**

A carboxy-containing interpolymer in which some of the carboxy radicals are esterified and the remaining carboxy radicals are neutralized by reaction with a polyamino compound having one primary or secondary amino group is useful as an additive in lubricating compositions and fuels. The interpolymer is especially effective to impart desirable viscosity characteristics and anti-sludge properties to a lubricating oil.

3,702,301

RICE OIL-CONTAINING COMPOSITION FOR USE AS CUTTING, PENETRATING OR LUBRICATING OIL

Eual E. Baldwin, P.O. Box 69, Alice, Tex. 78332

No Drawing. Continuation-in-part of application Ser. No. 707,288, Feb. 21, 1968. This application Apr. 15, 1971, Ser. No. 134,482
Int. Cl. C10m *1/26, 1/50*
U.S. Cl. 252—56 S **8 Claims**

Rice oil derived from whole grain rice is employed according to the present invention as a cutting, penetrating or lubricating oil. Optionally, the whole grain rice oil of the present invention can be de-waxed and blended with other active ingredients such as white mineral oil, dibasic esters of sebacic acid and oleic acid of a low titer to give superior compositions suitable for use in the above manner as well as an additive for waxes, film forming coatings, low pour point greases and lubricating oils, and cosmetics.

3,702,302

TRUE SELF-HEATING COMPOSITION

Vernon Columbus Wilson, 611 High St., Apt. 12–D, Newark, N.J. 07102

No Drawing. Filed May 28, 1970, Ser. No. 41,625
Int. Cl. B01j *13/00;* **C09k** *3/00, 3/02*
U.S. Cl. 252—70 **2 Claims**

This invention relates to a true self-heating one-unit composition which will produce heat when applied. This unique self-heating unit does not require mixing with another element outside of its composition to generate heat.

This unique one-unit composition also antiquates many other multi-unit compositions or other compositions which require mixing with another element to produce a desired result by making them a single one-unit self-contained composition. In one embodiment, the one-unit, heat-producing composition consists essentially of two different water-in-oil emulsion gels having the same viscosity and being in contact with each other, the first water-in-oil emulsion gel having hydrogen peroxide in its water phase and the second water-in-oil emulsion gel having potassium sulfite in its water phase.

3,702,303

CLEANING OF PHOTOCONDUCTIVE INSULATING SURFACES

Carl F. Clemens and Thomas B. Baker, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

No Drawing. Filed Sept. 15, 1970, Ser. No. 72,547
Int. Cl. C09d *9/62;* **C11d** *7/50;* **C23g** *5/02*
U.S. Cl. 252—163 **10 Claims**

Composition for cleaning photoconductive insulating surfaces comprised of an aqueous-organic liquid emulsion, and a surfactant. The composition may further include an abrasive and suspending agent. The composition preferably includes a non-flammable organic liquid of low toxicity; e.g., tetrachloroethylene, which is emulsified in the water in an amount to control the volatility thereof and thereby provide a composition which evaporates from the surface to be cleaned at a rate that permits effective cleaning without producing solvent films or stains.

3,702,304

PAINT REMOVER COMPOSITIONS

Raymond G. Esposito, R.F.D. 2, Union, Maine 04862

No Drawing. Continuation-in-part of abandoned application Ser. No. 670,427, Sept. 25, 1967. This application June 16, 1971, Ser. No. 153,867
Int. Cl. C09d *9/04;* **C11d** *7/50;* **C23g** *5/02*
U.S. Cl. 251—171 **10 Claims**

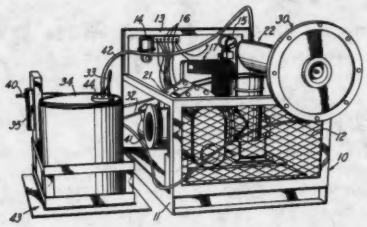
Removal of paint from exterior surfaces such as the outside of a house is facilitated by the use of an inexpensive, slow drying paint remover composition comprising

essentially an oil-in-water emulsion of xylol with either dimethyl formamide, dimethyl acetamide, dichloromethane, or mixtures thereof.

3,702,305
CHEMICAL OXYGEN GENERATOR
Tommy Lewis Thompson, Melbourne, Fla., assignor to Life Support, Inc., Melbourne, Fla.
No Drawing. Continuation-in-part of application Ser. No. 66,555, Aug. 24, 1970. This application Apr. 28, 1971, Ser. No. 138,299
Int. Cl. A62b *21/00;* **C01b** *13/02*
U.S. Cl. 252—187 **15 Claims**

A chemical oxygen generator formed of an alkali metal chlorate and one or more sodium or potassium oxides. The generator can be started by igniting an ignition cone or by the addition of water to a water initiatable cone associated therewith. Thereafter, catalytic decomposition by the sodium or potassium peroxide contained therein, or formed during reaction, causes generation of substantially pure oxygen with lesser heat evolution than the previous thermal decomposition type generators of the prior art.

3,702,306
FOGGING METHOD AND APPARATUS
David W. Waldron, Valdosta, Ga., assignor to Lowndes Engineering Co., Inc., Valdosta, Ga.
Original application Mar. 17, 1970, Ser. No. 20,364. Divided and this application Oct. 29, 1971, Ser. No. 193,840
Int. Cl. C09k *3/30*
U.S. Cl. 252—305 **7 Claims**

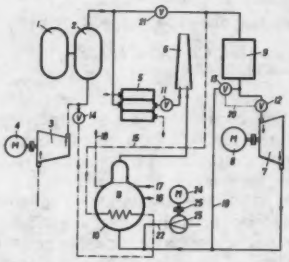


A fogging method and apparatus including a prime mover driving a blower for supplying air under pressure to a nozzle assembly. The nozzle assembly discharges the air therethrough along a plurality of circumferentially spaced spiral paths and along a centrally located axial path. Minute quantities of liquid such as concentrated pesticide are introduced into the axially directed discharging air and combined with the spirally directed discharging air to produce a fog.

3,702,307
HYDRATED EMULSIFIERS FOR BAKERY PRODUCTS
Max E. Norris, Parma, Ohio, assignor to SCM Corporation, Cleveland, Ohio
No Drawing. Filed July 27, 1970, Ser. No. 58,717
Int. Cl. B01f *17/34*
U.S. Cl. 252—356 **7 Claims**

A hydrated emulsifier containing from about 20–30% water, 20–30% of an ethoxylated partial fatty acid ester of polyhydric alcohol, from 35–45% of a partial fatty acid ester of polyglycerol and from 9–16% of a partial fatty acid ester of propylene glycol is set forth. The emulsifier contains a relatively low amount of water but yet provides for the making of sponge cakes of high specific volume.

3,702,308
PROCESS FOR THE UTILIZATION OF THE ENERGY CONTENT OF THE FLUE GAS ACCRUED IN CATALYTIC CRACKING PLANTS
Erich Bauer, Eggendorf, and Franz Reichard and Ferdinand Schwarz, Vienna, Austria, assignors to Osterreichische Mineralolverwaltung Aktiengesellschaft, Vienna, Austria
Filed Aug. 18, 1970, Ser. No. 64,670
Int. Cl. B01j *11/68;* **C10g** *11/18*
U.S. Cl. 252—417 **4 Claims**



An improvement in a process for utilization of the energy content of the flue gas accrued in catalytic cracking plants and for the economic control of such cracking plants, to thereby improve the entire effectiveness of such a plant and its adaptability to various operating conditions. The process comprises the steps of supplying the combustion air required for the regeneration of the catalyst to the regenerator by a compressor, supplying the accrued flue gas to an exhaust gas turbine by a cyclone being independent of said regenerator, said exhaust gas turbine is arranged particularly to drive a generator, burning the combustible part of CO contained in the flue gas in a catalytic CO boiler following the turbine, supplying the surplus air resulting from a slighter requirement of combustion air for heating to said CO boiler by means of a line (bypass line) leading past the cracking process and branching off between said compressor and said regenerator and mixing said surplus air to the flue gas coming from the regenerator before said cyclone.

3,702,309
POLYMERIZATION OF ETHYLENE USING REDUCED GROUP IV–B, V–B AND VI–B METAL SALTS AS THE POLYMERIZATION CATALYST
Karl Ziegler, Kaiser Wilhelm Platz 1, Mulheim (Ruhr), Germany, and Heinz Breil, Mulheim (Ruhr), Germany; said Breil assignor to said Karl Ziegler, Mulheim (Ruhr), Germany
No Drawing. Original application Aug. 9, 1955, Ser. No. 527,412, now Patent No. 3,579,493, dated May 18, 1971. Divided and this application Mar. 1, 1971, Ser. No. 119,854
Claims priority, application Germany, Aug. 13, 1954, Z 4,371; Aug. 14, 1954, Z 4,374
Int. Cl. B01j *11/78*
U.S. Cl. 252—429 **8 Claims**

A catalyst suited for the polymerization of olefins comprising a reduction product of vanadium oxychloride, an

acetylacetonate of a Group IV–B, V–B or VI–B metal, including thorium and uranium, and/or a halide of said metals containing only halogen and metal atoms. The reduction is effected in the absence of oxygen, moisture and active hydrogen containing compounds, using as reducing agent sodium hydride, lithium hydride and complexes of alkali metal hydrides with a boron compound of the formula BR'R''R''', where R', R'' and R''' are hydrocarbon, alkoxy, aryloxy or hydrogen.

3,702,310

GASKET-FORMING COMPOSITIONS HAVING IMPROVED RESISTANCE TO WATER-BASED AEROSOL PRODUCTS

Charles W. Simons, Bedford, and Joel A. Gribens, Framingham, Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 29, 1969, Ser. No. 795,107

Int. Cl. G08d *13/28*

U.S. Cl. 252—430 **2 Claims**

Compositions suitable for use as sealing gaskets in aerosol mounting cups composed of a peptized curable neoprene polymer dissolved in a volatile organic solvent which includes a curing system consisting essentially of sodium acetate, magnesium oxide and the 1,3-di-o-tolylguanidine salt of dicatechol borate. The compositions may be modified by the inclusion of ingredients, such as fillers, plasticizers, antioxidants, and pigments to impart desirable properties.

3,702,311

HALODEHYDROGENATION CATALYST

William Q. Beard, Jr., Wichita, Kans., assignor to Ethyl Corporation, New York, N.Y.

Filed July 14, 1969, Ser. No. 841,238

The portion of the term of the patent subsequent to Jan. 26, 1988, has been disclaimed and dedicated to the Public

Int. Cl. B01j *11/78*

U.S. Cl. 252—441 **7 Claims**

A supported catalyst for the halodehydrogenation of ethane to ethylene which contains: (a) copper halide and/or iron halide; (b) an alkali metal halide; (c) a rare earth halide; and (d) one of the following compounds: manganese halide, zinc halide, calcium halide or titanium halide.

3,702,312

FLUORIDE-CONTAINING CRYSTALLINE ALUMINO-SILICATES

William B. Wilson, Pleasant Hill, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 714,328, Mar. 19, 1968. This application Oct. 5, 1970, Ser. No. 78,248

Int. Cl. B01j *11/78, 11/40*

U.S. Cl. 252—442 **11 Claims**

A novel crystalline alumino-silicate containing fluorine incorporated into the crystalline structure is prepared by treating a divalent alkaline earth metal form of the alumino-silicate sequentially with a sequestering agent followed by treatment with a solution of aluminum, fluoride and chloride ions. The fluoride-containing alumino-silicates are highly active and stable hydroconversion catalysts when composited with a hydrogenative metal component.

3,702,313

PROCESS FOR THE PRODUCTION OF POLYAMIDE FOAMS

Heinrich Gilch and Kurt Schneider, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 11, 1968, Ser. No. 766,975

Claims priority, application Germany, Oct. 20, 1967, F 53,842

Int. Cl. C08j *1/18*

U.S. Cl. 260—2.5 N **5 Claims**

Improvement in the process for the production of polyamide foams by activated ionic polymerisation of lactams, in which organosiloxane-hydroxyalkylene block copolymers are added to the polymerisation mixture before polymerisation is started.

3,702,314

TRACING PRODUCT MIXTURE COMPRISING AN OLEFINIC POLYMER, AND ETHYLENE VINYL ACETATE COPOLYMER AND A HIGH BOILING SOLVENT

Raymond Farjon, Neuilly, Jacques Farce and Jacques Florent, Boulogne-sur-Mer, and Michel Dumoulin, Saint-Martin-les-Boulogne, France, assignors to Baignol & Farjon S.A., Boulogne-sur-Mer, Pas-de-Calais, France

No Drawing. Filed Dec. 7, 1970, Ser. No. 95,866

Claims priority, application France, June 10, 1969, 6919141

Int. Cl. C08f *29/12*

U.S. Cl. 260—23 H **8 Claims**

Mixtures based on thermoplastic materials for the manufacture of tracing products such as crayons and chalks, comprising olefinic polymers, 5–15% of ethylene-vinyl acetate copolymers and 5–15% of high boiling esters. The mixtures may also contain petroleum waxes, metal salts of fatty acids, epoxy resins, pigments, and fillers. The mixture may be injected-molded and may be enclosed in a molded sheath.

3,702,315

HEAT SENSITIVE LATICES

Donald P. Knechtges, Grafton, and George J. Antifinger, Avon Lake, Ohio, assignors to the B. F. Goodrich Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 798,466, Feb. 11, 1969. This application Oct. 21, 1970, Ser. No. 82,790

Int. Cl. C08f *45/24*

U.S. Cl. 260—29.6 MQ **10 Claims**

Synthetic latices are made heat-sensitive by the presence in the latex of a silicone polyether. The use of an organo-sulfonate in combination with a silicone polyether as a heat-sensitizing system for synthetic latices produces a heat-sensitive latex that is relatively stable at room temperature but that may be converted to a gel at a moderately low temperature. The silicone polyether when employed in combination with an organo-sulfonate compound may be used in significantly reduced amounts to impart heat-

sensitivity to the latex as compared to the amounts of silicone polyether required as the heat-sensitizing additive without the additive.

3,702,316
COLD BOX METHOD
Janis Robins, St. Paul, Minn., assignor to Ashland Oil Inc., Houston, Tex.
No Drawing. Continuation-in-part of application Ser. No. 72,113, Sept. 14, 1970, which is a continuation-in-part of application Ser. No. 723,873, Apr. 24, 1968, which in turn is a continuation-in-part of applications Ser. No. 569,106, Aug. 1, 1966, now Patent No. 3,429,848, and Ser. No. 536,180, Mar. 14, 1966, now Patent No. 3,485,797. This application Jan. 26, 1971, Ser. No. 109,946
Int. Cl. B22c *15/24*
U.S. Cl. 260—38 **6 Claims**

An improvement in cold box foundry core production methods in which a phenolic/isocyanate binder is cured with an organic base catalyst having a pK_b value ranging from about 7–11.

3,702,317
METHOD OF MAKING ARYLENE MODIFIED SILOXAZANES INCORPORATING CYCLODISILAZANE STRUCTURES
Laurence W. Breed, Overland Park, Kans., Richard L. Elliott, Kansas City, Mo., and Harold Rosenberg, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed Nov. 18, 1970, Ser. No. 90,836
Int. Cl. C08f *11/04*
U.S. Cl. 260—46.5 P **17 Claims**

A polymer composition of arylene modified siloxazanes incorporating cyclodisilazane structures is prepared by the condensation of arylenedisilanols and cyclodisilazane derivatives. The reaction is preferably carried out in a suitable solvent at sufficiently high dilution to make possible the formation of high molecular weight polymers. Gelling of the product polymer is prevented by treating the initial solution of reactants, after partial polymerization has been achieved, with a silylating agent capable of converting residual silanol groups of the disilanol to siloxane groups. Further polymerization to achieve still higher molecular weights is then possible and the products are stable for relatively long periods of time without gelling. Finally, the product polymers which exhibit good elastomeric properties as well as thermal stability can be compounded into rubbers by cross-linking the product polymer through use of a peroxide catalyst and preferably with the addition of a suitable filler.

3,702,318
THERMALLY STABLE HETEROCYCLIC ANTHRAQUINONE POLYIMIDES AND METHOD FOR THEIR SYNTHESIS
Charles E. Browning, New Carlisle, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Filed Aug. 11, 1971, Ser. No. 170,969
Int. Cl. C08g *20/32*
U.S. Cl. 260—47 CP **10 Claims**

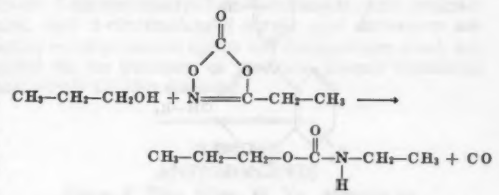
Aromatic heterocyclic polyimides having a high thermal stability are provided by the condensation of 2,3,6,7-anthraquinonetetracarboxylic dianhydride with an aromatic diamine, such as 2,6-diaminoanthraquinone. The high thermal stability of the polymers renders them suitable for use in many aerospace applications where high temperatures are encountered. In particular, the polymers are useful for producing laminates, molded articles, films, fibers, and ablative materials.

3,702,319
METHOD FOR INTRODUCING BORIC ACID INTO LIQUID HYDROCARBONS DURING THEIR AIR OXIDATION TO THE CORRESPONDING ALCOHOLS
Horst Grasemann, Marl, Germany, assignor to Chemische Werke Huels, A.G., Marl, Germany
Filed Nov. 6, 1968, Ser. No. 773,717
Claims priority, application Germany, Nov. 10, 1967, P 16 43 825.8
Int. Cl. C07c *35/02*
U.S. Cl. 260—617 H **15 Claims**

A method for improving the air oxidation of hydrocarbons to their corresponding alcohols by adding dried boric acid to liquid hydrocarbon in an air oxidation reactor by delivering the boric acid from a collecting container to an intermediate container and from there through a pocket wheel to be carried by an inert gas through a dip tube immersed in the hydrocarbon.

3,702,320
METHOD FOR PREPARING URETHANES FROM CYCLIC NITRILE CARBONATES AND A HYDROXYL-CONTAINING COMPOUND
William H. Fritok, Glenolden, Pa., Larry G. Wolgemuth, Cherry Hill, N.J., and Robert C. Strand, New City, N.Y., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed May 12, 1970, Ser. No. 36,697
Int. Cl. C08g *22/04*
U.S. Cl. 260—77.5 B **28 Claims**

Urethanes are prepared by condensing-rearranging a hydroxyl group-containing compound with a cyclic nitrile carbonate in the presence of a catalytically-effective amount of dissolved tin, titanium, zinc, bismuth, aluminum or iron compound in which the metal is in a valence state other than zero. Using, for instance, propanol and ethane nitrile carbonate as illustrative reactants, the urethane-forming condensation-rearrangement reaction can be represented as follows:



3,702,321
PROCESS FOR PREPARING BENZODIAZEPINE DERIVATIVES
Hisao Yamamoto, Nishinomiya-shi, Shigeho Inaba, Takarazuka-shi, Tadashi Okamoto, Ashiya-shi, Toshiyuki Hirohashi, Kobe, Kikuo Ishizumi, Minoo-shi, Michihiro Yamamoto, Takarazuka-shi, Isamu Maruyama, Minoo-shi, Kazuo Mori, Kobe, Tsuyoshi Kobayashi, Minoo-shi, and Takahiro Izumi, Takarazuka-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,708
Claims priority, application Japan, Apr. 2, 1968, 43/21,887; Apr. 4, 1968, 43/22,530; May 10, 1968, 43/31,466; May 17, 1968, 43/33,260; May 27, 1968, 43/36,249; June 13, 1968, 43/41,106
Int. Cl. C07d *51/72, 53/06, 57/02*
U.S. Cl. 260—239 BD **5 Claims**

A 2,3-dihydro-1H-1,4-benzodiazepine derivative, which is useful as tranquillizer, hypnotic, muscle-relaxant and anticonvulsant, is produced by hydrolyzing a 2-(dioxopiperazino)-benzophenone derivative. The 2-(dioxopiperazino)-benzophenone derivative is prepared by treating a 3-phenyl-indole-2-carboxylic acid ester derivative with a reactive ester of cyanomethylalcohol, and reducing the

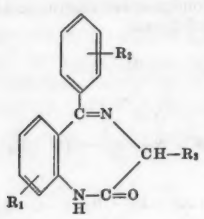
resulting 1-cyanomethyl compound, and then contacting the resulting piperazino-indole derivative with a suitable oxidizing agent.

3,702,322
DERIVATIVES OF LINCOMYCIN AND ITS ANALOGS AND PROCESS
Brian Bannister, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Apr. 6, 1970, Ser. No. 26,119
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 R **28 Claims**

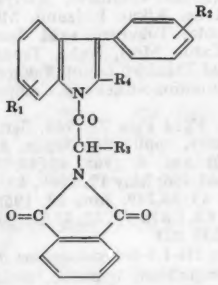
Alkyl 7-deoxy-7(S)-OR-α-thiolincosaminides useful as intermediates for preparing antibacterially active 7-deoxy-7(S)-OR-lincomycins are prepared by opening the aziridine ring of alkyl N-acyl-6,7-aziridino-6-deamino-7-deoxy-α-thiolincosaminides by hydrolysis or alcoholysis.

3,702,323
METHOD FOR PREPARING BENZODIAZEPINE DERIVATIVES
Hisao Yamamoto, Nishinomiya, Shigeho Inaba, Takarazuka, Tadashi Okamoto and Toshiyuki Hirohashi, Ashiya, Kikuo Ishizumi, Minoo, Michihiro Yamamoto, Toyonaka, Isamu Maruyama, Minoo, Kazuo Mori, Kobe, Tsuyoshi Kobayashi, Minoo, and Takahiro Izumi, Takarazuka, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed Apr. 7, 1970, Ser. No. 26,418
Claims priority, application Japan, Apr. 16, 1969, 44/29,904; May 29, 1969, 44/42,211
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 D **10 Claims**

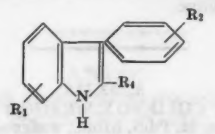
Novel and improved method for preparing benzodiazepine derivatives, which have prominent effects as tranquilizers, muscle relaxants, antispasmodics, anticonvulsants and hypnotics, represented by the formula,



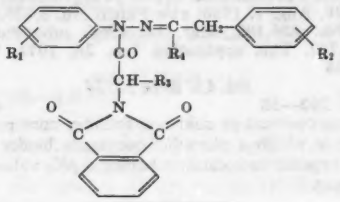
wherein R_1 is hydrogen, halogen, C_{1-4} alkyl, nitro or trifluoromethyl; R_2 is hydrogen or halogen; and R_3 is hydrogen or C_{1-4} alkyl. These benzodiazepine derivatives are prepared by reacting a novel 1-phthalimidoacyl-indole derivative represented by the formula,



wherein R_1, R_2 and R_3 are as defined above; and R_4 is hydrogen or C_{1-4} alkyl, with ozone and then contacting the reaction product with a hydrazine derivative. The 1-phthalimidoacyl-indole derivative is produced by phthalimidoacylation of an indole derivative represented by the formula,



or Fischer cyclization of a phthalimidoacyl-phenylhydrazone derivative represented by the formula,



wherein R_1, R_2, R_3 and R_4 are as defined above.

3,702,324
3,4,5-TRIMETHOXYBENZAMIDES OF SUBSTITUTED ANILINES AND OF ALKYLPIPERIDINES
Wilfred A. Skinner, Portola Valley, John G. Johansson, Palo Alto, and Howard L. Johnson, Sunnyvale, Calif., assignors to Stanford Research Institute, Menlo Park, Calif.
No Drawing. Filed June 24, 1970, Ser. No. 49,201
Int. Cl. C07d *29/30*
U.S. Cl. 260—293.53 **4 Claims**

3,4,5-trimethoxybenzamides of alkyl-substituted piperidines and aminopiperidines and of anilines substituted by such groups as alkyl, alkyloxy, thioalkyloxy, halo and nitro. These compounds are relatively non-toxic and are useful for pharmacological purposes. They exert a specific effect on the central nervous system and a somewhat lesser effect on muscle function, and thus have utility as tranquilizers.

3,702,325
INDOLE ALKALOID DERIVATIVES
Yves Louis-Marie Fellion, Gagny, France, assignor to Laboratoires Toraude, Paris, France
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,357
Int. Cl. C07d *35/32*
U.S. Cl. 260—240 AL **6 Claims**

Certain 1-substituted derivatives of reserpine, including rescinnamines and methoserpidines, have useful pharmaceutical properties. They may be prepared by 1-cyanoethylation of the parent alkaloid followed by conversion of the 1-propionitrile substituent into other groups.

3,702,326
FUSED RING TETRAAMINO COMPOUND, THE TETRATOSYLATE THEREOF, AND THEIR SYNTHESIS
Fred E. Arnold, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force
No Drawing. Original application Apr. 16, 1969, Ser. No. 816,839, now Patent No. 3,546,181. Divided and this application Aug. 5, 1970, Ser. No. 61,398
Int. Cl. C07d *51/78*
U.S. Cl. 260—250 R **5 Claims**

This invention comprises new thermally stable polymeric compositions, starting compounds and intermedi-

ates and methods for preparing the same. The polymers are prepared by the condensation of an aromatic tetra-acid, such as 1,4,5,8-naphthalene tetracarboxylic acid, and a tetraamino fused ring compound, namely 2,3,11,12-tetraamino-diquinoxal(2,3-e, 2',3'-1)pyrene. This fused ring tetraamino compound is prepared by the reaction of 1,2-ditosylate of 1,2,4,5-tetraaminobenzene with 1,2,6,7-tetraketopyrene to give a tetratosylated derivative which after treatment with concentrated H_2SO_4 followed by base gives the desired fused ring tetramino compound. The tetratosylate and the tetraamino fused ring compound and the ditosylated tetraamino benzene intermediate are new compounds. The latter can be prepared by the reduction of 1,2-dinitro-4,5-(p-toluene sulfamido)benzene. With appropriate tetraacids or their derivatives and with sufficient reaction of the reagents, ladder polymers can be formed.

3,702,327

N-BETA-1-(3-PHENYLIMIDAZOLIDIN-2-ONE) ETHYL 4,4-ETHYLENE DIOXYPIPERIDINES

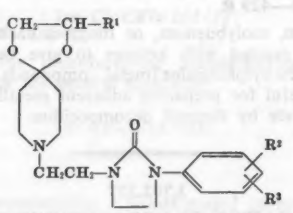
Jorge Pengman Li, Scotch Plains, N.J., and John Hans Biel, Lake Bluff, Ill., assignors to Aldrich Chemical Company, Inc., Milwaukee, Wis.

No Drawing. Filed Dec. 28, 1970, Ser. No. 102,171

Int. Cl. C07d *99/02*

U.S. Cl. 260—293.66 **18 Claims**

Compounds of the formula



wherein R^1 is a member selected from the group consisting of hydrogen, (lower) alkyl, phenyl and benzyl, and R^2 and R^3 each represent a member selected from the group consisting of chloro, bromo, iodo and trifluoromethyl; and the pharmaceutically acceptable nontoxic salts thereof exhibit tranquilizing activity and are useful as tranquilizers and antiemetic agents in mammals.

3,702,328

PROCESS FOR PREPARING THIAZOLE DERIVATIVES

Stephan P. Kukolja and Robert B. Morin, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed May 16, 1969, Ser. No. 825,401

Int. Cl. C07d *17/10*

U.S. Cl. 260—302 H **2 Claims**

Process for preparing thiazolecarbonylamino-substituted butenoic acids and new thiazolecarbonylamino-substituted oxazolone compounds, e.g., 2-[N-(2'-phenoxymethyl-4-thiazolyl)carbonyl]amino - 3 - methylbutenoic acid, and 2-(2'-phenoxymethyl-4'-thiazolyl)-4-isopropylidene-5-oxazolone by treating a 2-(2-substituted-amido-1-thioacetyl-2-ethenyl)-4-isopropylidene - 5 - oxazolone with acid or base, in an inert organic solvent, or in admixture with the alcohol of the desired ester, which products of the process can be used as antibiotics and antifungal agents, as intermediates in the synthesis of penicillin and cephalosporin compounds and as anti-radiation chemicals.

3,702,329

PROCESS FOR THE SEPARATION OF OPTICALLY ACTIVE ISOMERS FROM TETRAMISOLE

Francois Dewilde, Saint-Marc-Massy, and Guy Gabriel Frot, Noisy-la-Sec, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed June 1, 1970, Ser. No. 42,474

Claims priority, application France, June 2, 1969, 6918033

Int. Cl. C07d *99/10*

U.S. Cl. 260—306.7 **6 Claims**

Optical isomers are separated from a racemic base by reacting the base, or its salt with an optically inactive acid, in solution with 0.5 to 0.7 times the amount of an optically active acid theoretically required to convert completely the base into salts, and recovering the salt of the optically active acid with one optical isomer of the base by fractional crystallisation or fractional solution. The process is particularly applicable to the isolation of the l-dibenzoyl tartrate of the laevorotatory isomer of 6-phenyl-2,3,5,6-tetrahydroimidazo[2,1-b]thiazole, which is useful as an anthelmintic agent.

3,702,330

IMIDAZOLYL ACRYLIC ACID DERIVATIVES

Dale R. Hoff, Basking Ridge, N.J., and Clarence S. Rooney, Beaconsfield, Quebec, Canada, assignors to Merck & Co. Inc., Rahway, N.J.

No Drawing. Filed Oct. 5, 1970, Ser. No. 78,298

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **5 Claims**

5-nitroimidazolyl-2-acrylic acid and derivatives thereof are discolsed as well as processes for their preparation from 5-nitroimidazolyl-2-carboxaldehyde and malonic acid. Said 5-nitroimidazolyl acrylic acid derivatives are active as antiprotozoal agents and compositions which are useful for the treatment of protozoal diseases containing said agents are also disclosed.

3,702,331

ANTIOZONANTS

Elmer A. Tike, Nitro, W. Va., assignor to Security Chemicals, Inc., Nitro, W. Va.

No Drawing. Original application Sept. 27, 1968, Ser. No. 763,381, now Patent No. 3,580,885. Divided and this application July 7, 1970, Ser. No. 61,003

Int. Cl. C07d *27/26*

U.S. Cl. 260—326.9 **4 Claims**

The invention relates to novel N-substituted dimethyl pyrroles for use as antiozonants in rubber.

3,702,332

N-FURFURYL-MONOPHOSPHORYL ETHYLENE DIAMINES

Daniel Pillon and Jacques Ducret, Lyon, France, assignors to Pechiney-Progil, Lyon, France

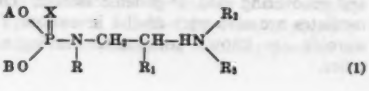
No Drawing. Filed Feb. 11, 1970, Ser. No. 10,599

Claims priority, application France, Feb. 20, 1969, 6904575

Int. Cl. C07d *5/16*

U.S. Cl. 260—347.7 **7 Claims**

Agricultural pesticides of the general formula:



(1)

wherein: A and B are identical or different lower alkyl radicals; X is oxygen or sulfur; R, R_1, and R_2 are hydrogen, or identical or different lower radicals; R_3 is either a lower alkyl radical, different from R_2, or an alkyl radical substituted by alkoxy, cyano, mono- or dialkylamino, or heterocyclic groups, or else, a cycloaliphatic or aryl radical. R_2 and R_3 may also form with the nitrogen atom a saturated, eventually substituted heterocycle, which may contain another heteroatom.

3,702,333

CYCLOPROPANECARBOXYLIC ACID ESTERS POSSESSING PESTICIDAL PROPERTIES

Michio Nakanishi and Toshihiko Mukai, Oita, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Aug. 7, 1968, Ser. No. 750,776

Claims priority, application Japan, Aug. 11, 1967, 42/51,511; Mar. 5, 1968, 43/14,200

Int. Cl. C07d *5/20;* **A01n** *9/28*
U.S. Cl. 260—397.4 **3 Claims**

2 - methyl-5-(2-propynyl)-3-furylmethyl 2,2,3,3 - tetramethylcyclopropanecarboxylate and 2 - methyl-5-(2-propynyl)-3-furylmethyl chrysanthemate are useful pest control agents, e.g. against flies, mites, cockroaches, beetles, moths, etc.

3,702,334

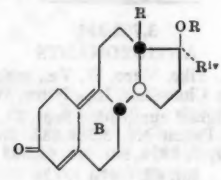
PROCESS FOR THE PREPARATION OF 17-SUBSTITUTED-Δ^4-GONENES AND INTERMEDIATES

Julien Warnant, 16 Place du Marche, 92 Neuilly-sur-Seine, France; Jean Jolly, Vallee des Anges C.D., 93 Clichy-sous-Bois, France; and Robert Joly, 8 Rue Chevalier, 95 Montmorency, France

No Drawing. Filed Aug. 12, 1970, Ser. No. 63,277

Int. Cl. C07c *167/02*
U.S. Cl. 260—397.4 **3 Claims**

A process for the production of a Δ^4-gonenic steroid having the formula



wherein R represents a member selected from the group consisting of hydrogen and the acyl of an organic carboxylic acid having from 1 to 18 carbon atoms, R′ represents an alkyl having from 1 to 4 carbon atoms, R^{iv} represents a member selected from the group consisting of lower alkyl, lower alkenyl or lower alkynyl, and B represents a member selected from the group consisting of two hydrogens in the 9α and 10β position and a double bond which comprises the steps of reacting a 3-ketal-4,5-seco-gonane-5-one with a ketalizing agent, oxidizing the resultant 3,5-diketal-4,5-seco-gonane-17β-ol, reacting the resultant 3,5-diketal-4,5-seco-gonane-17-one with an organometallic compound, hydrolyzing the resultant 3,5-diketal-17α-R^{iv}-4,5-secogonane-17β-ol, cyclizing the resultant 17α-R^{iv}-4,5-seco-gonane-17β-ol-3,5-dione and recovering said Δ^4-gonenic steroid. The novel intermediates are also part of the invention. The Δ^4-gonenic steroids are known compounds having steroidal properties.

3,702,335

THIOESTERS OF STEROIDS

Claude Lafille, Bretteville, sur Oron, France, assignor to Etablissements Clin-Byla, Paris, France

No Drawing. Filed Feb. 8, 1971, Ser. No. 113,768

Claims priority, application France, Feb. 11, 1970, 4,784

Int. Cl. C07c *169/32*
U.S. Cl. 260—397.45 **10 Claims**

Prednisolone and dexamethasone derivatives are provided, in which the 21-position carries a carboxyl group derived from a thionated amino acid, such as methionine or cysteine, in which the amino group is connected to a protective group such as the benzyloxycarbonyl group or the acetyl group and/or the sulphur atom is attached to a methyl radical or to a protective group, e.g. the benzyloxycarbonyl group or the benzyl group. The compounds have local anti-inflammatory action.

3,702,336

REACTION PRODUCTS OF KETONES WITH CARBONYL-pH_3 COMPLEXES OF CHROMIUM, MOLYBDENUM, AND TUNGSTEN

Ulrich Klabunde, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 10, 1970, Ser. No. 97,009

Int. Cl. C07f *11/00;* **C23c** *11/00*
U.S. Cl. 260—429 R **17 Claims**

Chromium, molybdenum, or tungsten carbonyl phosphines are reacted with ketones to give carbonyl(hydroxyhydrocarbylphosphine)metal compounds. The products are useful for preparing adherent metallic coatings on a substrate by thermal decomposition.

3,702,337

PREPARATION OF ORGANOTHIOBORATES

Jean-Marc Lalancette, 2261 Bachand St., Sherbrooke, Quebec, Canada

No Drawing. Filed Mar. 2, 1970, Ser. No. 15,966

Int. Cl. C07f *5/04*
U.S. Cl. 260—462 R **4 Claims**

Organothioborates are prepared by reacting sulfurated sodium or potassium borohydride with from 50 to 100 percent excess of a mercaptan in petroleum ether or other low boiling diluent, such as hexane, heptane or benzene. The products of the reaction in addition to the organothioborate are insoluble alkali metal polysulfide and soluble disulfide. The insoluble polysulfide is filtered off. The organothioborate is then separated from the disulfide by distillation of the filtrate.

3,702,338

HYDROXY-METHYLATED DERIVATIVES OF RESIN ACIDS, THEIR USE IN ELASTOMERIC POLYURETHANES

John B. Lewis and Glen W. Hedrick, Lake City, Fla., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed May 12, 1970, Ser. No. 36,672

Int. Cl. C07c *69/74*
U.S. Cl. 260—468.5 **1 Claim**

The preparation of a new series of polyols derived from naval stores is described and their use in polyurethanes is

demonstrated. Small amounts of these resin acid derivatives give added strength to polyurethane films prepared from propylene glycol polyethers and could very well be useful intermediates for industry. Increasing amounts of these new glycols blended with trimethylolpropane, 1,4-butanediol, and a polypropylene glycol and reacted with TDI gave clear strong films with tensile strengths around 5000 p.s.i. Further addition resulted in harder, more brittle films. Because of the brittle character of most of the films, use of the polymers probably would be limited to coating applications. On the other hand, change in the formulation in one instance resulted in films having fair low temperature and elastomeric properties. The diisocyanate requirements are reduced when the polyols are used as a component of the glycol system.

3,702,339

PROCESS FOR MANUFACTURING β-AMINOCARBOXYLIC ACID DERIVATIVES AND/OR THE CORRESPONDING α,β-UNSATURATED CARBOXYLIC ACID DERIVATIVES

Herbert Eck and Joseph Heckmaier, Burghausen, Upper Bavaria, Helmut Prigge, Munich, and Hellmuth Spes, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,297

Claims priority, application Germany, Oct. 3, 1967, P 16 43 568.0

Int. Cl. C07c *101/12*

U.S. Cl. 260—482 R **6 Claims**

Process for manufacturing β-aminocarboxylic acid derivatives of the general structure

$$R-\underset{\displaystyle NR'R''}{\underset{|}{CH}}-CH_2COOR'$$

and the corresponding α,β-unsaturated carboxylic acid derivatives of the general structure

$$R-CH=CH-CO-OR'$$

which comprises reacting compounds of the general formula

$$R-\underset{\displaystyle NR'R''}{\underset{|}{CH}}-OR'$$

with ketene, where, in the above formulas

R=H, phenyl residues,
R', R''=alkyl residue with 1–4 C-atoms.

3,702,340

OXIDATION PROCESS EMPLOYING NITROGEN OXIDE CATALYSIS FOR THE PREPARATION OF HUMATES FROM COAL

Clifford E. Selin, Salt Lake City, Lloyd B. Lyon, Midvale, Stanford T. Holbrook, Salt Lake City, and Francis H. Hammond, Bountiful, Utah, assignors to American Hydrocarbon Company, Salt Lake City, Utah

Filed Oct. 8, 1968, Ser. No. 767,924

(Filed under Rule 47(a) and 35 U.S.C. 116)

Int. Cl. C07c *63/00*

U.S. Cl. 260—515 H **14 Claims**

An oxidation process employing nitrogen oxide catalysis for the preparation of humates and other organic chemicals from coal. The process comprises the steps of introducing oxygen and a catalytic amount of a nitrogen oxide into a reactor containing a pulverized coal, to which 5% to 50% moisture has been admixed, maintaining the reactor at a temperature below the boiling point of water, terminating the reaction within at least ten hours and recovering humates and other organic chemicals.

3,702,341

METHOD OF RECOVERING LYSINE FROM A FERMENTATION BROTH

Moriyoshi Ishida and Terutsugu Hori, Kawasaki, Kanagawa-ken, Yuzuru Otsuka, Tokyo, Kunimitsu Sato, Kawasaki, Katsuyuki Inoue, Yokohama, and Yoshio Ogata, Kawasaki, Kanagawa-ken, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

No Drawing. Filed Jan. 19, 1970, Ser. No. 4,109

Claims priority, application Japan, Feb. 3, 1969, 44/7,990

Int. Cl. C07c *99/02*

U.S. Cl. 260—527 N **5 Claims**

Lysine can be recovered from fermentation broths containing the same by adjusting the pH to 3–7 with hydrogen chloride and making the broth supersaturated with lysine monohydrochloride dihydrate, if the original broth meets the requirements that the weight ratio X of lysine to total solids is at least 0.32, and that the mol ratio Y of added hydrogen chloride to lysine in the adjusted broth satisfies the condition that XY is at least 0.32. The recovered lysine monohydrochloride dihydrate is practically pure and may be further purified or converted to other forms of lysine.

3,702,342

FUMARIC ACID CRYSTALLIZATION PROCESS

Gene M. Kibler, Terre Haute, Ind., and Clifton L. Singleton, Brown Deer, Wis., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed July 2, 1971, Ser. No. 159,484

Int. Cl. C07c *51/42*

U.S. Cl. 260—537 N **2 Claims**

In a process for preparation of fumaric acid crystals by the catalytic isomerization of maleic acid solution, slow agitation during isomerization and then simultaneously slow cooling at a rate of about 0.25–6.2° C. per minute after isomerization is substantially complete, results in fumaric acid crystals having a relatively low content of fine materials.

3,702,343

2-METHYL-2-(TERTIARY ALKYL CYCLOHEXYL) PENTAN-4-ONES AND PROCESSES

Muus G. J. Beets and Harm van Essen, Hilversum, Netherlands, assignors to International Flavors & Fragrances Inc., New York, N.Y.

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,192

Int. Cl. C07c *46/29*

U.S. Cl. 260—586 B **1 Claim**

Novel products produced by the process of reducing by means of hydrogenation a 2-methyl-2-(4'-t-alkylphenyl)-pentan-4-one and then oxidizing the resulting product so produced.

3,702,344

NOVEL FORMAMIDE DERIVATIVES

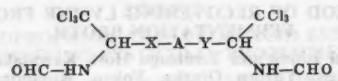
Walter Ost, Klaus Thomas, and Dietrich Jerchel, Ingelheim am Rhein, Germany, assignors to C. H. Boehringer Sohn, Ingelheim am Rhein, Germany

No Drawing. Filed July 15, 1970, Ser. No. 55,270

Int. Cl. C07c *103/00*

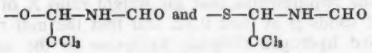
U.S. Cl. 260—561 S 21 Claims

Compound of the formula



wherein X and Y are each oxygen, sulfur, —SO— or —SO_2—; and A is

(a) straight or branched alkylene of 2 to 10 carbon atoms, whose carbon chain may be interrupted by 1 to 3 oxygen atoms, by a sulfur atom, by an —SO— group, by an —SO_2— group, by a cyclohexylene group or by a phenylene group, where said phenylene group may have substituents attached thereto, said substituents being selected from the group consisting of 1 to 2 chlorine or bromine atoms,



(b) cyclohexylene; or

(c) phenylene, which may have 1 to 4 halogen, 1 to 2 lower alkyl or 1 to 2 lower alkoxy substituents attached thereto;

the compounds are useful as biocidal agents, especially as systemic fungicidal agents against all types of phytopathogenic fungi, such as mildew, plant rust and Fusaria.

3,702,345

PROCESS FOR CONVERTING ETHYLENE TO NORMAL ALPHA OLEFINS

Herbert B. Fernald and William Gall, Glenshaw, Russell G. Hay, Gibsonia, and Alfred N. Kresge, Verona, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Oct. 6, 1970, Ser. No. 78,557

Int. Cl. C07c *3/10*

U.S. Cl. 260—683.15 D 9 Claims

In a process wherein ethylene is treated with an aluminum hydrocarbon to obtain a product predominating in normal alpha olefins, the improvement which involves heating said product at an increased temperature level for a short period of time prior to recovery of the normal alpha olefins.

3,702,346

CONVERSION OF ETHYLBENZENE TO STYRENE

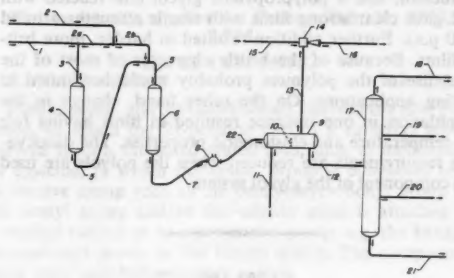
James S. Kellar, Des Plaines, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed June 30, 1971, Ser. No. 158,303

Int. Cl. C07c *15/10*

U.S. Cl. 260—669 R 5 Claims

In a process for the steam dehydrogenation of ethylbenzene to styrene, the selectivity of the dehydrogenation reaction is improved by maintaining the reactor products



settler, wherein condensed reactor products are separated, at a pressure less than atmospheric.

3,702,347

PARA-XYLENE RECOVERY AND PRODUCTION

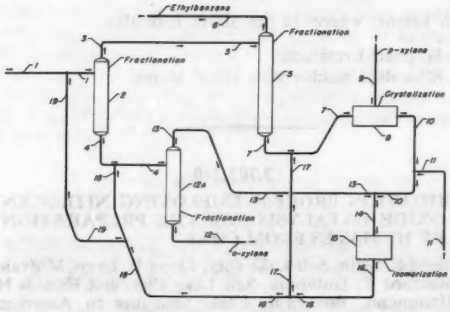
George F. Adams, Tulsa, Okla., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Nov. 9, 1970, Ser. No. 87,691

Int. Cl. C07c *7/12*

U.S. Cl. 260—674 A 12 Claims

A process for the recovery of para-xylene from a C_8 aromatic mixture wherein the mixture is separated by fractional distillation to produce a relatively ortho-xylene-free, ethylbenzene, para-xylene and meta-xylene fraction and a relatively ethylbenzene-free ortho-xylene, meta-xylene and para-xylene fraction wherein the meta-xylene and para-xylene are present in a meta-xylene to para-xylene ratio of about 4:1 to about 7:1. The ethylbenzene fraction is separated by fractional distillation to produce a relatively pure ethyl-benzene overhead stream and a mixed



meta-xylene-para-xylene bottoms stream. This meta-xylene-para-xylene containing bottoms stream is then separated by fractional crystallization to produce a relatively pure para-xylene product stream and a residual para-xylene-meta-xylene stream of approximately eutectic compo-

sition. Preferably, the residual para-xylene-meta-xylene stream and the mixed meta-xylene and para-xylene stream produced in the first fractionation are isomerized to produce additional quantities of para-xylene.

3,702,348

PROCESS FOR THE PREPARATION OF SATURATED MONOCYCLIC MONOTERPENES

Rudolf Nehring and Gunter Hockele, Marl, and Gerhard Ludwig, Lippramsdorf, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

No Drawing. Filed Oct. 19, 1970, Ser. No. 82,209

Claims priority, application Germany, Oct. 20, 1969, P 19 52 725.4

Int. Cl. C07c *13/16*

U.S. Cl. 260—675.5 **12 Claims**

An improved process for the hydrogenation of eucalyptol and/or 1,4-cineol and mixtures of unsaturated monocyclic monoterpenes comprising reducing them, preferably continuously with a hydrogenation catalyst which prior to reduction consists essentially of

nickel, 10–60% by weight;
calcined aluminum oxide, 10–87.3% by weight;
zinc oxide, 0–40% by weight; and
silicon dioxide, 0–5% by weight.

3,702,349

LOW TEMPERATURE CURING PROCESS AND COATING COMPOSITIONS SUITABLE THEREFOR

Thomas R. Merlino, North Providence, R.I., and John H. Flickinger, Houston, and Russell T. McFadden, Freeport, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Apr. 29, 1970, Ser. No. 33,036

Int. Cl. C08g *45/04*

U.S. Cl. 260—830 R **27 Claims**

Coatings may be cured by this process below 50° F. and at temperatures as low as —10° F. Suitable coating compositions comprise a solution in an inert organic solvent of (1) a polyaziridinyl adduct having more than one aziridinyl hydroxyalkyl group per molecule and (2) a coreactant which may be a dicarboxylic acid anhydride or a polyfunctional material having more than one anhydride, oxirane, thiol, sulfonic acid or carboxylic group per molecule.

3,702,350

POLYESTER FIBERS WITH ALIPHATIC SULPHONIC ACID CONTAINING ANTISTATIC AGENTS

Isao Kimura and Fumimaro Ogata, Osaka, and Koichiro Ohtomo, Settu, Osaka-fu, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

No Drawing. Continuation-in-part of application Ser. No. 30,212, Apr. 20, 1970. This application July 12, 1971, Ser. No. 161,883

Claims priority, application Japan, Apr. 22, 1969, 44/31,415

Int. Cl. C08g *45/14*

U.S. Cl. 260—835 **10 Claims**

A fiber having durable antistatic and hydrophilic properties to withstand repeated launderings, which comprises a polymer composition consisting of 99.95–60% by weight of a synthetic linear polyester or polyesterether and 0.05–40% by weight of at least one sulphonic acid containing compound which is prepared by sulphonating an epichlorohydrin homopolymer or an alkyleneoxide/epichlorohydrin block copolymer. The sulphonic acid containing compound may contain also an active chlorine atom, unsaturated methylene group or epoxy group.

3,702,351

CATIONIC THERMOSETTING RESINS CONTAINING THE REACTION PRODUCT OF A CARBOXYL TERMINATED POLYESTER WITH AN EPOXY AMINE ADDUCT TREATED WITH EPICHLOROHYDRIN

Gerard Tesson, Auzouer-en-Touraine, France, assignor to Manufacture de Produits Chimiques Protex, Levallois, Hauts-de-Seine, France

No Drawing. Filed June 9, 1970, Ser. No. 44,906

Int. Cl. C08g *45/14*

U.S. Cl. 260—835 **7 Claims**

A water-soluble cationic thermosetting resin is produced by reacting a polyester resin having terminal carboxyl groups with an epoxy-amine addition compound and condensing the product with epichlorhydrin. The wet strength of paper is improved by impregnating same with a solution of the resin and drying the paper.

3,702,352

CRYSTALLINE BLOCK COPOLYMERS OF ALIPHATIC ALPHA-OLEFINS AND PROCESS OF PREPARING SAME

Irving Leibson, Wyckoff, N.J., assignor to Dart Industries Inc., Los Angeles, Calif.

No Drawing. Continuation of abandoned application Ser. No. 610,502, Jan. 20, 1967. This application Nov. 16, 1970, Ser. No. 90,124

Int. Cl. C08f *15/04*

U.S. Cl 260—878 B **9 Claims**

Novel compositions of block copolymers of alpha-olefins and processes therefor which compositions have improved contact clarity when molded over compositions of the prior art processes. The compositions comprise

(a) 80% to 95% by weight of a pre-segment consisting essentially of a random copolymer of (1) 90–98.5 mole percent of an alpha-olefin having 2 to 9 carbon atoms and (2) 1.5–10 mole percent of an alpha-olefin having 2 to 9 carbon atoms different from (1),
(b) 5% to 20% by weight of a post-segment consisting essentially of a homopolymer of an alpha-olefin having 2 to 9 carbon atoms which is the same as (a) (1).

3,702,353

CONTINUOUS PROCESS FOR MANUFACTURING SMALL PARTICLE NITROCELLULOSE

Larry D. Henderson, Bryans Road, and Robert C. Wilson, Indian Head, Md., assignors to the United States of America as represented by the Secretary of the Navy

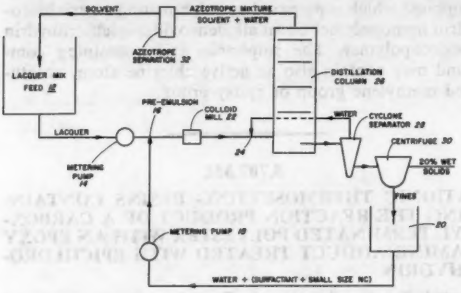
Filed Sept. 24, 1970, Ser. No. 75,054

Int. Cl. C06b *21/02*

U.S. Cl. 264—3 D **5 Claims**

A continuous process for manufacturing small particle nitrocellulose, such as plastisol nitrocellulose, wherein the nitrocellulose lacquer is pre-emulsified by contact with

a stream of water in a pipe T, completely emulsified in a colloid mill, partially drowned by contact with a second



stream of water and completely drowned by passing directly into a distillation column.

3,702,354

METHOD FOR PREPARING POLYBUTADIENE ACRYLONITRILE PROPELLANT AND EXPLOSIVE MATERIALS AND PRODUCTS THEREOF

James P. Diebold and Judson B. Eldridge, China Lake, Calif., assignors to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Feb. 20, 1970, Ser. No. 18,030
Int. Cl. C06d *5/06*
U.S. Cl. 264—3 D 8 Claims

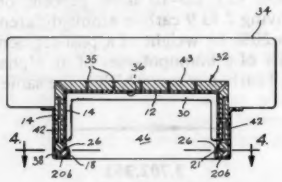
A process for the rapid production of filled polybutadiene acrylonitrile formulations which form well consolidated shapes having uniform strength which, briefly, comprises preparing a gel by mixing the polybutadiene acrylonitrile rubber in a suitable solvent, adding a rubber crosslinker, plasticizer or vulcanizing agent; stirring in a filler such as salts, metals, carbon black, etc., extracting the solvent; pouring the product into drying trays; and drying at room temperature. The product is ready to be extruded or block-pressed into various predetermined shapes.

3,702,355

METHOD OF FORMING A MOLDED ARTICLE OF MANUFACTURE WITH STRENGTHENING MEMBERS FORMED THEREIN

William G. Hayden, Elkhart, Ind., assignor to Chemcraft Incorporated, Elkhart, Ind.

Filed Sept. 16, 1970, Ser. No. 72,689
Int. Cl. B29c *17/04, 3/02*
U.S. Cl. 264—92 3 Claims



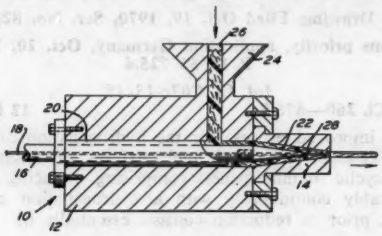
An article of manufacture formed of molded sheet material which carries a plurality of article strengthening members. The strengthening members constitute a removable part of the mold during forming of the article and are retained by the formed sheet material upon separation of the material from the permanent part of the mold. The article strengthening members are not interconnected and are adapted for movement relative to each other after the formed sheet material has been separated from the mold.

3,702,356

PROCESS FOR PRODUCTION OF GLASS-FILLED THERMOPLASTIC PELLETS SUITABLE FOR BLENDING WITH THERMOPLASTIC

Norman T. Hall, Santa Ana, Calif., assignor to Liquid Nitrogen Processing Corporation, Malvern, Pa.

Continuation-in-part of application Ser. No. 833,983, June 17, 1969. This application Mar. 27, 1970, Ser. No. 23,213
The portion of the term of the patent subsequent to Sept. 21, 1988, has been disclaimed
Int. Cl. B29c *17/14*
U.S. Cl. 264—141 3 Claims



The process consists of feeding an extruded mixture of silane coupling agent, and molten thermoplastic (with or without glass fibers) to a cross-head die, coating continuous glass roving with said mixture in said cross-head die, solidifying said molten thermoplastic while said thermoplastic is coated on said roving, and pelletizing the solidified material. Such pellets may be blended wth thermoplastic, and thereafter molded to yield an article having high tensile strength.

3,702,357

UNIFORMITY OF POLYESTER FILMS

Edward W. Smith, Jr., Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Continuation of abandoned application Ser. No. 820,662, Apr. 30, 1969. This application June 25, 1971, Ser. No. 157,045
Int. Cl. B29c *17/02, 25/00*
U.S. Cl. 264—289 3 Claims

Conventionally heat-set, biaxially oriented polyester films such as poly(ethylene terephthalate) generally have non-uniform physical properties across the width of the film. It has been discovered that the relative uniformity of such properties across the width of the film can be significantly increased by stretching the film in the transverse direction (during the tentering step) while the surfaces of the film are maintained at a substantially uniform temperature of at least about 260° F., which is higher than was heretofore believed practical in a tentering operation.

3,702,358

CIS - 1 - HEXADECEN-1-OL ACETATE AS AN ATTRACTANT FOR ADULT MALE PINK BOLLWORM MOTHS

Nathan Green, Silver Spring, Md., and John C. Keller, Tempe, Ariz., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Original application Dec. 2, 1968, Ser. No. 780,596, now Patent No. 3,586,712, dated June 22, 1971. Divided and this application Dec. 2, 1970, Ser. No. 94,555
Int. Cl. A01n *9/24, 17/14*
U.S. Cl. 424—84 1 Claim

An ester, cis-7-hexadecen-1-ol acetate, also known as "hexalure" is found to be a powerful attractant under field conditions for adult male pink bollworm moths.

3,702,359

CERTAIN MICROBIAL INSECTICIDES AND METHODS OF PREPARATION THEREOF

Howard T. Dulmage, Jose A. Correa, and Adelaido J. Martinez, Brownsville, Tex., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Oct. 30, 1970, Ser. No. 85,787
Int. Cl. A01n *15/00*
U.S. Cl. 424—93 3 Claims

Two biological insecticides and method of preparation thereof are disclosed. In the one method polyhedral inclusion bodies of the nuclear polyhedrosis virus of the cabbage looper, *Trichoplusia ni*, were precipitated from concentrated suspensions in 4–6% solutions of lactose upon addition of acetone. Alternate steps to the method of preparation are also provided. A dry resuspendable product (in water) is obtained.

In the second method, the spore-crystalline toxin complex of *Bacillus thuringiensis* was precipitated from concentrates derived from fermentation beers resuspended in 4–6% lactose upon addition of acetone. A dry powder containing the crystalline toxin live spore complex is thus provided.

3,702,360

METHOD OF CONTROLLING INSECTS ON ANIMALS WITH ORGANOTIN COMPOUNDS

Dell Derek Paul Graham, Balgowlah, New South Wales, Australia, assignor to M & T Chemicals (Australia) Pty. Limited, Unanderra, New South Wales, Australia

No Drawing. Filed May 23, 1969, Ser. No. 827,148
Claims priority, application Australia, May 23, 1968, 38,234/68
Int. Cl. A61k *27/00*; A61l *23/00*
U.S. Cl. 424—288 5 Claims

This invention is directed to an insect parasiticidal composition for the control and elimination of insect parasites living on or in the fleeces and/or hides of domestic animals, comprising as active ingredient at least one member selected from the group consisting of organotin compounds.

3,702,361

INSECTICIDAL METHODS USING N-SUBSTITUTED HETEROCYCLIC PHENACYL HALIDES AND YLIDS

Wendell Gary Phillips, Olivette, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,918
Int. Cl. A01n *9/22*
U.S. Cl. 424—263 20 Claims

Pyridinium, halides having an N-(phenacyl) substituent and the corresponding ylids obtained therefrom by alkaline treatment are useful as insecticides.

3,702,362

USE OF UREIDO DIPHENYL SULFONES IN THE TREATMENT OF MAREK'S DISEASE

Tsung-Ying Shen, Westfield, David B. R. Johnston, Warren, and Theodore A. Maag, New Shrewsbury, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Sept. 17, 1970, Ser. No. 73,246
Int. Cl. A61k *27/00*
U.S. Cl. 424—322 14 Claims

Certain diphenyl sulfones having 4,4'-substituents, the substituents being independently nitro, amino, acetamido, formamido, loweralkoxycarbonyl, or ureido, can be used to reduce mortality and decrease lesion incidence of poultry exposed to Marek's disease. The use of these compounds and compositions comprising the compounds as active ingredients are provided.

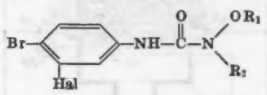
3,702,363

FUNGICIDAL AND NEMATOCIDAL COMPOSITIONS AND METHODS OF COMBATING FUNGI OR NEMATODES USING N-(4-HOMO-3 - HALOPHENYL)-N' - LOWER ALKYL - N'-LOWER ALKOXY-UREA

Henry Martin, Basel, Hans Aebi, Riehen, and Ludwig Ebner, Stein, Aargau, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

No Drawing. Division of application Ser. No. 870,916, Oct. 2, 1969, now Patent No. 3,617,249, which is a division of application Ser. No. 543,541, Apr. 19, 1966, now Patent No. 3,497,541, which in turn is a continuation-in-part of application Ser. No. 191,442, May 1, 1962, now Patent No. 3,288,851. This application May 21, 1971, Ser. No. 145,949
Int. Cl. A01n *9/12, 9/20*
U.S. Cl. 424—322 5 Claims

This invention relates to the use as fungicides and nematocides of compounds having the formula



wherein Hal represents bromine or chlorine and R_1 and R_2 each represents a lower alkyl.

3,702,364

STABILIZED CHLORAMPHENICOL COMPOSITION

Malcolm P. Boghosian, Long Beach, and John W. Wilson, Jr., Los Altos, Calif., assignors to Allergan Pharmaceuticals, Santa Ana, Calif.

No Drawing. Continuation-in-part of abandoned application Ser. No. 605,713, Dec. 29, 1966. This application Feb. 9, 1970, Ser. No. 9,986
Int. Cl. A61k *21/00*
U.S. Cl. 424—324 2 Claims

A physically and chemically stable chloramphenicol solution comprising relatively small amounts of chloramphenicol stabilized by a polyoxyethylene derivative of a fatty acid in combination with a long-chain polyol.

3,702,365

4-ACETOACETYL AMINO-DIPHENYLAMINE IN COMPOSITIONS AND METHODS FOR TREATING PAIN, FEVER AND INFLAMMATION

Kurt Thiele, Barcelona, Spain, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed June 17, 1971, Ser. No. 154,202
Int. Cl. A61k *27/00*
U.S. Cl. 424—324 15 Claims

4-acetoacetylamino-diphenylamine is useful in pharmacological preparations to reduce fever. It also has antiphlogistic and analgesic activity while at the same time showing very low toxicity.

3,702,366

BIS-(TETRAHALOETHYL) TRISULFIDES AS SEED DISINFECTANTS

Gustave K. Kohn, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Original application Nov. 29, 1968, Ser. No. 780,292, now Patent No. 3,574,767, dated Apr. 13, 1971. Divided and this application Sept. 21, 1970, Ser. No. 74,232
Int. Cl. A01n *9/00, 9/12*
U.S. Cl. 424—336 4 Claims

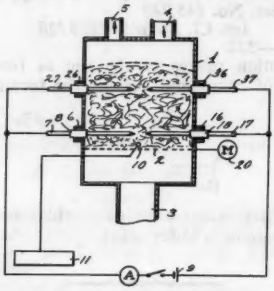
Compositions and methods of disinfecting seeds with bis-(tetrahaloethyl) trisulfides are provided.

ELECTRICAL

3,702,367
PROCESS AND ARRANGEMENT FOR STARTING REACTOR FOR REACTION OF FERROSILICON WITH GASEOUS HALOGENATION AGENT

Heinz-Rudiger Vollbrecht, Rheinfelden/Baden, Germany, assignor to Deutsch Gold-und Silber-Schudeanstalt vormals Roessler, Frankfurt (Main), Germany

Filed March 19, 1971, Ser. No. 125,938
Int. Cl. H05b *3/60*
U.S. Cl. 13—23 **6 Claims**

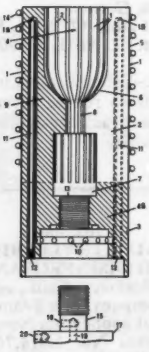


The reaction of ferrosilicon with a gaseous halogenation agent is started by flowing a protective gas upwardly through a ferrosilicon charge on a grate, conducting an electric current through the charge at least until a temperature of 200° C. is reached and then replacing the protective gas by the halogenation agent, e.g., hydrogen chloride gas, and stopping the flow of electric current as soon as the exothermic reaction is self-sustaining. An apparatus for carrying out this process is also disclosed.

3,702,368
CRUCIBLES

David Ainsworth Hukin, The Cottage, 20 Manor Road, Oakley, England

Filed Dec. 30, 1970, Ser. No. 102,608
Claims priority, application Great Britain, Jan. 9, 1970, 1,139/70
Int. Cl. H05b *5/16*
U.S. Cl. 13—26 **7 Claims**

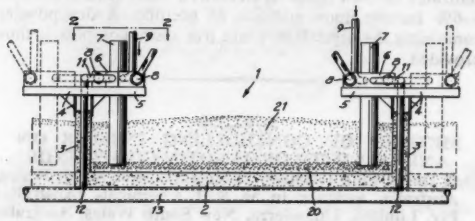


The invention provides an improved design for a crucible for the melting of materials by means of radio frequency eddy currents induced in the materials. A segmented platform is located intermediate an open end of the crucible and a closed base at the opposite end, in a region where the crucible wall is segmented, thereby to separate a melt from the "cold spot" in the crucible caused by the electrical short circuit of the closed base end. The outer surface of the wall segments is curved and defines a single cylindrical surface to facilitate fitting within a primary induction coil.

3,702,369
SILICON CARBIDE FURNACE

John Bell, Chippawa, Ontario, Canada, assignor to Norton Company, Worcester, Mass.

Filed Jan. 7, 1971, Ser. No. 104,622
Int. Cl. H05b *3/60*
U.S. Cl. 13—20 **3 Claims**

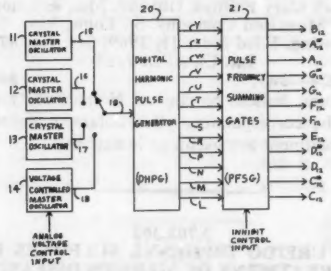


This invention relates generally to furnaces which are useful in the production of silicon carbide, and particularly to an improved manner of supporting and locating the electrodes utilized in such furnaces.

3,702,370
DIGITAL TONE GENERATOR SYSTEM FOR ELECTRONIC ORGAN EMPLOYING A SINGLE MASTER OSCILLATOR

John Ray Hallman, Jr., Green Bank, W. Va.

Filed May 19, 1971, Ser. No. 144,874
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **6 Claims**



For use in electronic organs and the like, an electronic circuit for generating a number of signals, the frequencies of which may correspond to the notes of the musical scale, comprises a single master oscillator producing an alternating signal coupled to a harmonic pulse frequency generator producing a number of harmonically related pulse frequency outputs which are selectively connected to summing means, each summing means producing a single output frequency which corresponds to a note of a musical scale. Twelve summing means may be connected selectively to produce the twelve notes of a musical scale.

3,702,371

SPACER-DAMPER FOR ELECTRICAL POWER LINES

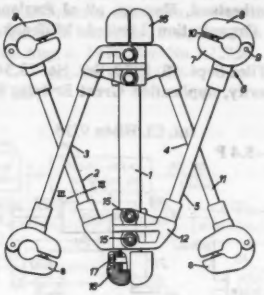
Walter Bloch, Leatherhead, and Christopher Richard Stevens, Crawley, both of England, assignors to Bowthorpe-Hellermann Limited

Filed Jan. 18, 1971, Ser. No. 106,998

Claims priority, application Great Britain, Jan. 21, 1970, 3,040/70

Int. Cl. H02g 7/14, 7/12

U.S. Cl. 174—42 5 Claims



This invention concerns a line conductor spacer including a plurality of spacer arms one for each conductor and preferably formed from one or more stranded cables, relatively movable jaws on each arm to engage and clamp onto its respective conductor, a spacer arm carrying member from which the spacer arms extend, and weight means secured to the arm carrying member for damping movements of the conductors.

3,702,372

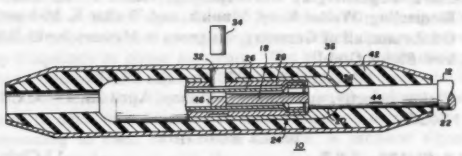
MOLDED CORONA SHIELD FOR A HIGH VOLTAGE COUPLING

Arthur M. Troccoli, Old Bridge, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 21, 1971, Ser. No. 154,904

Int. Cl. H02g 15/08

U.S. Cl. 174—73 S 8 Claims



A molded corona shield structure for a high voltage coupling, molded about the outer surface of the coupling and extending beyond the end thereof with an axial passage therethrough to permit entry of a conductor through such corona shield into the inner cavity of such coupling while making a tight fit with the exposed cable insulation. The corona shield is molded from a semi-conductive material composed of elastomeric materials containing a high percentage of highly conductive carbon black. Placed about the outer surface of the corona shield and the coupling is an insulating jacket so arranged as to form an intimate void free interface between the inner surface of the insulating jacket and the outer surface of the corona shield. A semi-conductive layer placed about the outer surface of the insulating jacket may be suitably joined to the semi-conductive outer layer of a cable by means of semi-conductive tape to finish the splice.

3,702,373

INTRINSICALLY STABLE SUPERCONDUCTIVE CONDUCTOR

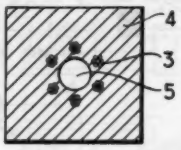
Jean-Francois Ecomard, Chilly-Mazarin, and Jacques Maldy, Wissous, both of France, assignors to Compagnie Generale D'Electricite, Paris, France

Filed March 1, 1972, Ser. No. 230,717

Claims priority, application France, March 5, 1971, 7107722

Int. Cl. H01b 5/00, 7/34

U.S. Cl. 174—126 CP 8 Claims



Intrinsically stable superconductive conductor enabling a tube made of stabilizing metal to be dispensed with, comprising filaments composed of several strands 10 to 50 microns in diameter, each of the said filaments being covered by a very fine layer of metal, the unit formed by seven of these filaments constituting a strand, said strands being coated by extrusion with a cover made of aluminum having high mechanical resistance.

3,702,374

COLOR VIDEO SIGNAL RECORDING AND REPRODUCING APPARATUS WITH PILOT SIGNAL FOR AUTOMATIC COLOR CONTROL

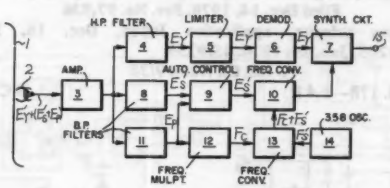
Toshihiko Numakura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed April 13, 1970, Ser. No. 27,715

Claims priority, application Japan, April 17, 1969, 44/29866The portion of the term of this patent subsequent to May 25, 1988, has been disclaimed.

Int. Cl. H04n 9/02

U.S. Cl. 178—5.2 R 7 Claims

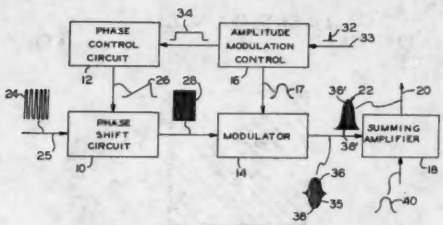


In a color video signal recording and reproducing apparatus that records and reproduces a pilot signal along with the color video signal, so that any amplitude fluctuating component of the reproduced chrominance signal resulting from the recording and reproducing operations has its counterpart or corresponding variation in the pilot signal, the reproduced modulated chrominance signal and pilot signal are mixed to provide a mixed signal which is subjected to amplitude control, the pilot signal is separated from the amplitude-controlled mixed signal, variations in the pilot signal thus separated are detected, and such detected variations are employed for determining the amplitude control exerted on the mixed signal, whereby to diminish undesired variations in the chrominance signal derived from the amplitude-controlled mixed signal.

3,702,375
AMPLITUDE MODULATION TEST CIRCUIT

David J. Jurgensen, Hillsboro, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed March 17, 1971, Ser. No. 125,091
Int. Cl. H04n 9/02
U.S. Cl. 178—5.4 TE 7 Claims

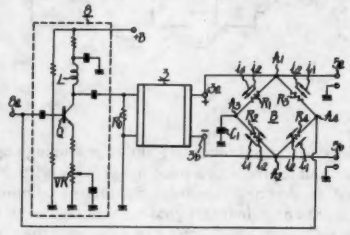


A phase shift circuit progressively shifts the phase of a carrier prior to modulation of the carrier in a balanced modulator with a sine wave test pulse which has a time duration equaling a few cycles of the carrier. The modulator output has a sine wave envelope which should be symmetrical about a horizontal axis in an oscilloscope display. A similar sine wave pulse is added to this output of the correct amplitude and phase to cause all of the envelope to be on one side of such axis. If this pulse is sent through a circuit under test and such circuit is operating correctly, one boundary of the envelope in the output is a straight line coincident with such axis. The test pulse has a fixed phase relationship with the carrier so that corresponding cycles of the carrier occupy the same positions in the envelope in the absence of the progressive phase shift referred to above. Under these conditions, the actual coincidence of one boundary of the envelope with a straight line cannot be accurately determined in the oscilloscope display. The progressive phase shift, however, fills the envelope with traces of the carrier to provide a substantially continuous boundary or edge of the envelope for comparison with a straight line.

3,702,376
COMB FILTER CIRCUIT

Katsuo Isono, Tokyo, and Hisao Okada, Kanagawa-ken, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1970, Ser. No. 97,936
Claims priority, application Japan, Dec. 16, 1969, 44/101205; Jan. 29, 1970, 45/9259
Int. Cl. H03n 9/38
U.S. Cl. 178—5.4 R 8 Claims

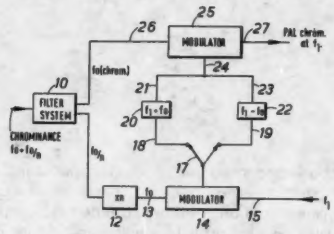


A comb filter circuit for separating luminance and chrominance signal components from a composite color television signal transmitted with the luminance and chrominance signal components in a frequency interleaved relation, comprises a delay means for delaying the composite color television signal by one horizontal scanning period and a bridge circuit connected to the delay means and consisting of four sections of substantially equal impedance. To the bridge circuit the delayed and non-delayed composite color television signals are suppled and therein the addition and the subtraction of both signals are performed, so that the luminance and chrominance signals are derived separately from the output terminals of the bridge circuit.

3,702,377
APPARATUS FOR CONVERTING SUPPRESSED CARRIER CHROMINANCE SIGNALS INTO PAL FORMAT

James A. Kerr; Bernhard J. Rogers, both of London, and Leslie J. Sutherland, Harrow, all of England, assignors to The Rank Organisation Limited, Millbank, London, England

Filed Sept. 18, 1970, Ser. No. 73,349
Claims priority, application Great Britain, Sept. 18, 1969, 46,124/69
Int. Cl. H04n 9/36
U.S. Cl. 178—5.4 P 6 Claims

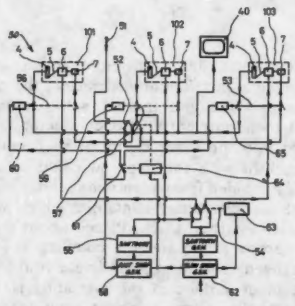


Suppressed carrier chrominance signal is translated to a desired frequency and in PAL form using a pilot signal at a sub-multiple of carrier frequency. Sum and difference signals are formed from a carrier frequency harmonic of the pilot and a wave at the desired frequency and appear alternately from line to line. These are combined with the chrominance signal to provide a desired PAL signal.

3,702,378
METHOD FOR TRANSMITTING TELEVISION-COMPATIBLE VIDEO AND AUDIO INFORMATION BY MEANS OF AUDIO FREQUENCY AND DEVICE FOR PRACTICING THE METHOD

Richard Bogenberger, Oberneuching; Heinz F. K. Busch, Riemerling; Walter Kroy, Munich, and Walter E. Mehnert, Ottobrunn, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH

Filed April 20, 1970, Ser. No. 29,826
Claims priority, application Germany, April 28, 1969, P 19 21 702.8
Int. Cl. H04n 1/02
U.S. Cl. 178—5.8 R 12 Claims



A transmitter emits a high frequency carrier signal having relatively narrow modulation band of which the greater por-

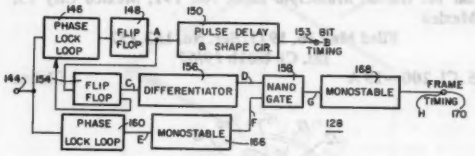
tion thereof is used for handling video information and the remainder is used for audio information. The video information is first stored in suitable storage tubes and is then retrieved and applied to the frame sweep controls of a conventional television receiver while simultaneously supplying to the audio portion thereof the audio signal above mentioned.

3,702,379

DATA TRANSFERRING SYSTEM UTILIZING FRAME AND BIT TIMING RECOVERY TECHNIQUE

James W. Peterson, Elmhurst, and John A. Tempka, Glenview, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Aug. 6, 1970, Ser. No. 61,730
Int. Cl. H04j *3/06*
U.S. Cl. 179—15 BS **17 Claims**



The transmitter-encoder of the data transferring system includes a combiner which develops an information signal by sequentially sampling the output states of a plurality of data sources. A timing signal generator develops bit and frame timing control signals for the combiner and a carrier and two pilot signals which are synchronized with the control signals to facilitate timing recovery at a receiver-decoder of the data transferring system. A composite signal comprised of an encoded information signal, carrier and pilots is transferred to the receiver through a medium which might produce abnormal information, such as an undesired frequency shift or phase perturbations, in the signal at the receiver-decoder input. The receiver includes circuitry which derives the carrier signal to facilitate demodulation. A demodulation circuit establishes the difference of each of the pilot signals and the encoded information signal from the carrier to produce two difference mixing signals and a difference information signal which have any frequency shift caused by the medium eliminated therefrom. One of the two difference mixing signals is utilized to reconstruct the bit timing signal and the other mixing signal along with a control signal derived from the bit timing signal is utilized to provide a frame timing signal which does not have any frequency or phase ambiguity. The bit and frame timing signals operate a bit separator included in the receiver which selectively channels the decoded data from the information signal to each of a plurality of data utilization devices corresponding to each of the data sources. A monitor signal which is synchronized with the data signal and which has a known pulse code may form part of the information signal to facilitate secure data transmission.

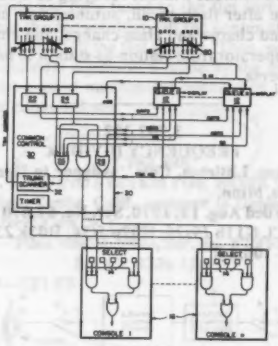
3,702,380

QUEUE FOR ELECTRONIC TELEPHONE EXCHANGE

Klaus Gueldenpfenning, Penfield; Uwe A. Pommerening, and Stanley L. Russell, both of Webster, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Jan. 21, 1971, Ser. No. 108,380
Int. Cl. H04q *3/64*
U.S. Cl. 179—27.0 **6 Claims**

The identifying number of the trunk circuit and a mark are stored in a set of recirculating stores such as in the queue when the trunk circuit is seized in response to an incoming call. If the queue is empty and an operator is available, the queue directs the call to an operator loop. If all of the operators are busy, the number and mark are stored until one is available. The trunks are served in the same sequence in which their numbers are entered in the registers. Each time the trunk scanner of the common control finds a marked trunk, its identifying number is compared with the stored numbers. If a match is not found and the queue is not already full, the trunk number and mark are entered at the end of the queue. If the marked trunk matches the first marked number in the stores, and an operator is available, the queue signals



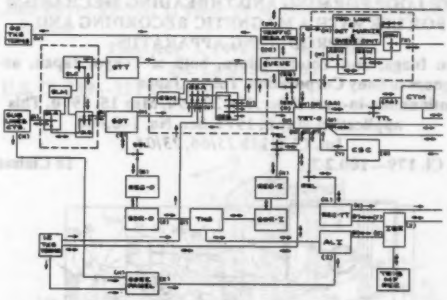
the common control to serve the marked trunk and erases the corresponding mark in the queue. First in, first out is ensured by running the stores through a complete cycle on each operation. An output display drive circuit is included to provide a visible indication of the number of calls in the queue at any time.

3,702,381

TELEPHONE SWITCHING SYSTEM INCLUDING TOLL SERVICE DESK

Don Edward Halbedel; Benjamin J. Bagwell, both of Galion; James Leroy Horning, Crestline; Erik Axel Lissakers, Perrysville; Joseph Harold Long, Galion, all of Ohio; Cameron C. Schweitzer, Runnemede, N.J., and Jack E. Callender, deceased, late of Galion, Ohio (by Evelyn N. Callender, administratrix), assignors to North Electric Company, Galion, Ohio

Filed March 12, 1969, Ser. No. 806,787
Int. Cl. H04m *3/42*
U.S. Cl. 179—27 FF **47 Claims**



A telephone central office system incorporating a toll service desk with special switching equipment including toll recording trunks which reduces the extent of operator participation in processing telephone calls, and which uses a reduced number of trunks to effect improved service. Operators at the toll service desks can handle call items in any order, but cannot release a call until all requirements are met. In calls requiring operator participation, the operator may release once the service necessary to establish or forward the call is given, and is relieved from manually having to make out

tickets on any calls except on calls to subscribers in non-dialable offices involving alpha-numeric directory numbers.

Special features of the system include flash recall of an operator at any time on any call, automatic answer time display upon flash recall from a non-coin station, automatic answer time display during the initial period and elapsed time display after the initial period upon flash recall from a coin station, reestablishment without rekeying of a call in the forward direction after flash recall, automatic or manual insertion of time and charge and class-change, and changing a call status by the operator from station-to-station to person-to-person and vice versa.

3,702,382

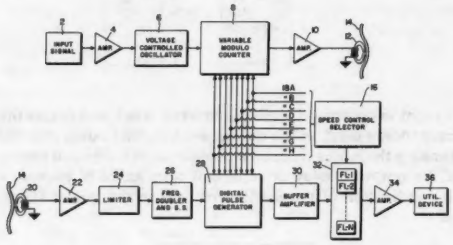
FREQUENCY DIVIDER

Ivars P. Breikss, Littleton, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Aug. 11, 1970, Ser. No. 62,870

Int. Cl. G11b *19/26*; H02p *5/34*; H03k *23/00*

U.S. Cl. 179—100.2 R **10 Claims**



A recording and reproducing apparatus for frequency modulation recording of an input data signal wherein the recording carrier frequency and the speed of driving a recording medium are concurrently selected in a digitally presettable sequence wherein the members of the sequence may be related to each other by any integral number. Similarly, the reproducing of a recorded FM signal is effected by an apparatus using the selected recording medium drive speed and a frequency discriminator digitally adaptable to the preset recording carrier frequency.

3,702,383

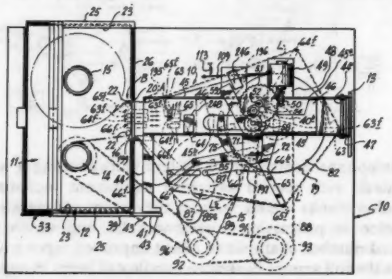
TAPE LOOP FORMING AND THREADING MECHANISM FOR USE WITH A MAGNETIC RECORDING AND REPRODUCING APPARATUS

Katsu Inaga, and Yotaro Miura, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 37,694, May 15, 1970. This application May 6, 1971, Ser. No. 140,666

Int. Cl. G11b *15/66, 23/04*

U.S. Cl. 179—100.2 T **18 Claims**



In a magnetic recording and/or reproducing apparatus, take-up and supply reels, preferably in a cassette or cartridge and having a tape wound on the reels and extending therebetween, are rotatably mounted on the chassis which also supports rotary magnetic head means movable in a circular path spaced from the reels and coinciding with the periphery of a tape guide drum, and tape guiding fingers are initially disposed close to each other to engage the tape between the reels and, while close to each other, are moved as a group to withdraw tape from the reels in the cassette, whereupon, the fingers are moved away from each other to form a loop in the tape withdrawn from the reels and then to drop the loop from the fingers and guide the inner surface of the loop into contact with at least part of the guide drum.

3,702,384

DISTRIBUTOR FOR SIX CYLINDER INTERNAL COMBUSTION ENGINE INCLUDING TWO CAM OPERATED CONTACT BREAKER ASSEMBLIES

Cesar M. Garza, Municipio Lipre No. 191, Mexico City 13, Mexico

Filed May 16, 1971, Ser. No. 153,237

Int. Cl. H01h *19/62*

U.S. Cl. 200—19 A **2 Claims**

This invention consists of a vertically disposed cup-shaped housing mounted on a shaft that is connected to the cam shaft of an internal combustion engine. The aforesaid cup-shaped housing contains a mechanism supporting plate in the upper portion thereof on which is mounted two opposed arms having electrical contacts on one end thereof and a breaker cam follower projecting outward from one side of each arm and in contact with flat surfaces interconnected by curved surfaces that are located on the periphery of a breaker cam that is mounted on the upper end of the aforesaid shaft. The aforesaid flat surfaces are in equal spaced relation around the breaker cam, and are not as long as the curved surfaces.

3,702,385

DISTRIBUTOR DEVICE WITH VACUUM ADVANCE MECHANISM OPERATED SWITCH STRUCTURE ATTACHED TO HOUSING

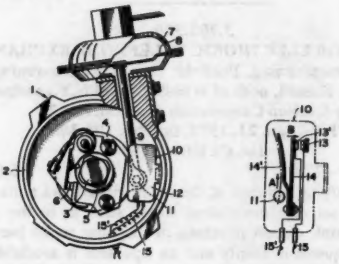
Shigetake Yoshimura, Hiroshima, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima-ken, Japan

Filed May 20, 1971, Ser. No. 145,215

Claims priority, application Japan, June 3, 1970, 45/55173

Int. Cl. H01h *21/80*

U.S. Cl. 200—31 **9 Claims**



A distributor device includes a rotating shaft driven by an engine and having a cam with which ignition points are

opened, a movable plate rotatable against a case where ignition points are mounted, a diaphragm means, viz. vacuum spark advancing means operated by the vacuum of an inlet manifold in an engine and connected with the movable plate in order to change the on-off timing of the ignition points, and a vacuum electric switching means opened and closed by the operation of the diaphragm means.

3,702,386

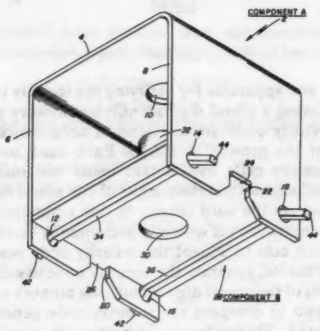
MECHANICAL COUPLING ARRANGEMENT

Richard A . Foerstner, Iowa City, Iowa, assignor to Amana Refrigeration Inc., Amana, Iowa

Filed April 6, 1971, Ser. No. 131,618

Int. Cl. H05b *9/06*; B01d *3/00*; B23k *1/16*

U.S. Cl. 219—10.55 **2 Claims**



A mechanical arrangement is disclosed for interconnecting structures by exerting equidistant upward forces to one component and an intermediate downward force to the adjacent component. A twisting motion of rotatably disposed locking members actuates the coupling. In an illustrative embodiment a magnetron energy generator and magnetic field producing means, such as an electromagnet, are coupled together by support and housing structures actuated by rigid elongated metallic bars which provide a positive locking force.

3,702,387

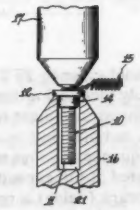
ELECTRICAL CONNECTIONS

Leo I. Klein, Clairton, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed June 4, 1971, Ser. No. 150,010

Int. Cl. B23k *9/28*

U.S. Cl. 219—91 **2 Claims**



In an electric resistance heating element, the invention relates to the assembly of a resistor coil to a terminal pin to provide mechanical and electrical connection therebetween. The assembly is particularly suited for use in strip heaters wherein the coil is connected to the flat head of a terminal bolt.

A group of convolutions of the resistor coil are flattened against the bolt head and welded thereto by a resistance welding operation. In the method disclosed, the shank of the bolt is disposed within an opening in one welding electrode of a welding machine with the bolt head overlying the tip of such electrode, and the group of convolutions of the coil are placed against the flat surface of the bolt head. The other welding electrode has a rounded tip and as this electrode is moved toward said one electrode, its rounded tip flattens the group of convolutions in overlapping relation on the flat surface of the bolt head. With the flattened convolutions and the bolt head firmly gripped between the welding electrodes, welding current is caused to flow between the electrodes to weld the flattened convolutions to the flat surface of the bolt head. Those flattened convolutions at the center of the rounded tip of said other electrode are fully fused to the flat surface of the bolt head, whereas the convolutions off the center of such rounded tip have a stick weld to the flat surface. Thus, not only is a low resistance electrical connection made by the fully fused convolutions, but a good mechanical connection is made by the stick-welded convolutions.

3,702,388

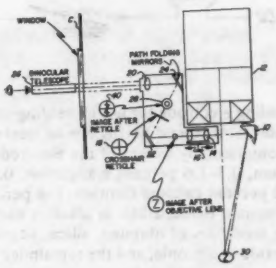
OPTICAL VIEWING SYSTEM FOR WORK CHAMBERS

James R. King, Tustin, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 9, 1970, Ser. No. 87,854

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **8 Claims**



An optical system for illuminating, viewing and aligning work in a vacuum chamber. The apparatus is predicated on the use of a clear or reflectively coated glass strip which becomes and remains a mirror surface as vapor from the material being worked is deposited on the glass surface. The duration of the permitted exposure is a function of the material type and the quantity of vapor released. The glass strip is then indexed to expose a new clear surface.

3,702,389

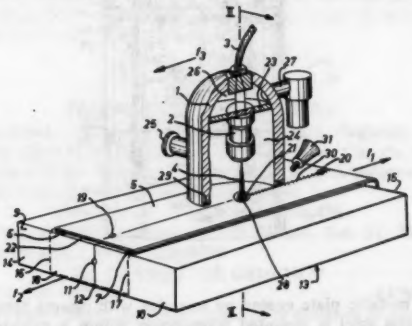
WELDING BY ELECTRON BOMBARDMENT

Jean-Pierre Peyrot, 1, place de la Division Leclerc, Villejuif, France

Filed Aug. 3, 1970, Ser. No. 60,534

Int. Cl. B23k *15/00*

U.S. Cl. 219—121 EB **5 Claims**

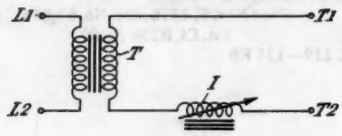


Electron beam welding apparatus wherein means are provided for welding a joint sealed by a sheet of foil and thereafter depositing a plastic product on the weld head to prevent contamination.

3,702,390
ARC WELDING

Paul Desmond Blake, Bishops Stortford; Roy Douglas Johnston, Braughing Ware; Brian Phelps, Roydon near Harlow; Edwin Albert Chapman, Potters Bar, and Ronald Leonard Bartlett, Chestnut, all of England, assignors to Murex Welding Processes Limited, Hertfordshire, England

Division of Ser. No. 661,637, Aug. 18, 1967, Pat. No. 3,573,426. This application Feb. 10, 1970, Ser. No. 14,888
Claims priority, application Great Britain, Oct. 31, 1966, 48,640/66; Nov. 1, 1966, 48,972/66; Nov. 8, 1966, 49,927/66; March 15, 1967, 12,186/67; March 23, 1967, 13,776/67; April 5, 1967, 15,578/67; April 5, 1967, 15,579/67; April 10, 1967, 16,380/67
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **4 Claims**

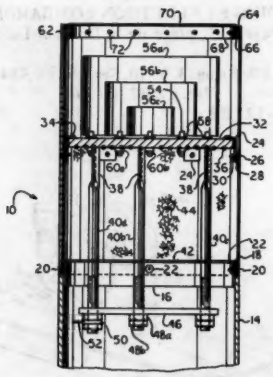


An arc welding electrode for use in welding processes in air; devoid of external flux, and having a mild steel sheath enclosing a core containing by weight of the electrode 1.5–4.5 percent aluminum, 0.3–1.6 percent manganese, 0.0–0.6 percent silicon, 5–15 percent calcium fluoride, 1–8 percent arc stabilizers of magnesium oxide, alkali or alkaline earth metals, 1–4 percent slag modifiers of alumina, silica, titania, manganese oxide, iron oxide or zirconia, and the remainder iron.

3,702,391
INFRARED CONCENTRATING EMITTER

Jerry N. Wellnitz, La Mesa, and Richard S. Dummer, Escondido, both of Calif., assignors to Rohr Industries, Inc.

Filed Oct. 24, 1969, Ser. No. 869,263
Int. Cl. H05b *3/10*
U.S. Cl. 219—553 **8 Claims**

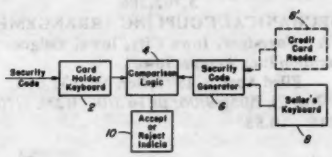


A metallic plate coated on one side with plasma sprayed stainless steel is mounted transversely within a cylindrical housing. Metallic cylinders having different lengths are concentrically disposed within the housing and extend from coated side of plate. Plate is electrically heated, causing coating thereon to radiate infrared rays which are filtered by a polyimide sheet extended across end of housing.

3,702,392
METHODS FOR VERIFYING THE IDENTITY OF A CARD HOLDER AND APPARATUS THEREFOR

Lloyd E. St. Jean, Huntington, Long Island, N.Y., assignor to Interface Industries, Inc.

Filed Nov. 20, 1970, Ser. No. 91,504
Int. Cl. G06k *7/00*
U.S. Cl. 235—61.7 B **23 Claims**

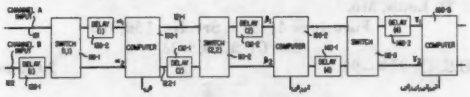


Methods and apparatus for verifying the identity of a bearer of a card having a plural digit identifying number and an associated security code are provided in accordance with the teachings of the present invention. Each card holder is assigned a security code by the card issuer and such security code is associated with certain digits of the plural digit identifying number on the card issued. In one embodiment of the present invention a card which is presented is verified by apparatus which acts to accept the security code presented by the bearer thereof, generate the security code associated with certain digits of the plural digit identifying number on the card presented and to compare the security code generated with that presented. Thereafter an indication is provided as to whether or not the card presented should be accepted based on a successful or unsuccessful comparison operation.

3,702,393
CASCADE DIGITAL FAST FOURIER ANALYZER

Peter Siegfried Fuss, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1970, Ser. No. 82,572
Int. Cl. G06f *7/38*
U.S. Cl. 235—156 **10 Claims**



A single input channel cascade FFT processor includes a plurality of substantially identical arithmetic units connected by a delay and switching arrangement for selectively delaying subsets of input data samples and intermediate results. By reordering an input sequence and thus selectively delaying, all components are operated at full capacity at all times, while a reduced amount of storage (delay) is required. Alternate embodiments provide for multiplexing a plurality of input data channels and multiplexing arithmetic units among a plurality of stages.

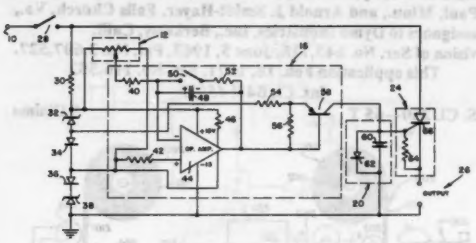
3,702,394
ELECTRONIC DOUBLE INTEGRATOR

Paul J. Rainsberger, and Charles M. Dye, Jr., both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the United States Navy

Filed Sept. 17, 1970, Ser. No. 72,906
Int. Cl. G06g *7/18, 7/78*
U.S. Cl. 235—183 **1 Claim**

An electronic double integrator circuit including an accelerometer; first and second integrators, at least one of which

has an operational amplifier with capacitive-resistive feedback; and a logic circuit. The system provides an output when



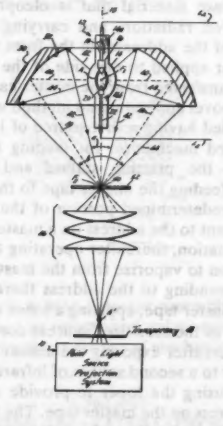
the accumulated input derived from the accelerometer indicates that a spatial, rather than time, interval has occurred.

3,702,395

CONDENSER SYSTEM FOR HIGH INTENSITY LIGHT SOURCE

Gottfried R. Rosendahl, Winter Park, Fla., assignor to The United States of America as represented by the Secretary of the Navy

Filed Oct. 9, 1970, Ser. No. 79,416
Int. Cl. F21v *13/04*
U.S. Cl. 240—41.3 **1 Claim**



An elliptical mirror is utilized in combination with a xenon arc projection lamp and a high melting point metal stop to provide in one embodiment an improved vertical axis point light source for point light source projectors, and in another embodiment to provide a condensed, vertical axis beam which is annular in section for panoramic projectors using transparencies having an azimuthal scene recorded in annular form.

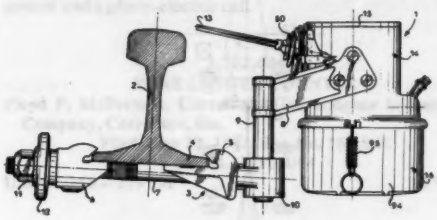
3,702,396

APPARATUS FOR DETECTING THE RUNNING OF RAILWAY VEHICLES OR THE LIKE

Marcel Luc Amedee Paulve, 83 Le Muy, France

Filed Aug. 19, 1970, Ser. No. 64,981
Claims priority, application France, Aug. 19, 1969, 6928448
Int. Cl. B61l *13/02*
U.S. Cl. 246—248 **12 Claims**

An electromechanical railway traffic controller device for detecting the passage of railway vehicles or trains comprising an electric rotary switch with a vertical shaft pivoted to the switch actuating lever consisting of a long arm lying adjacent to the rail for being hit by the wheel flange of a railcar; and a



damping arrangement for slowing down the spring-biased return motion of said arm to prevent said arm of being hit by every wheel of the vehicle or train.

3,702,397

INFRA-RED GAS DETECTORS

Jack Graham Firth, Chapeltown, and Thomas Alwyn Jones, Dronfield, both of England, assignors to National Research Development Corporation, London, England

Filed Feb. 16, 1971, Ser. No. 115,677
Int. Cl. G01n *21/26*
U.S. Cl. 250—43.5 R **15 Claims**

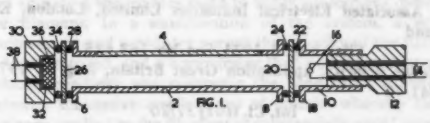


FIG. 1.

Means for detecting a component of an atmosphere comprises a source of radiation and a detector arranged so as to receive and be responsive to radiation through said atmosphere from the source, the intensity of the radiation from the source increasing rapidly with respect to wavelength just below the peak of an absorption band of the chosen component, and the response of the detector decreasing rapidly with respect to wavelength just above the peak of the absorption band. Selection of source, detector and radiation filters allows detection of one component, such as methane or carbon monoxide, without falsification of the result by another component such as carbon dioxide.

3,702,398

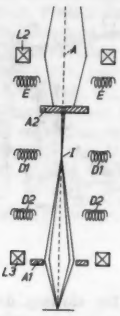
ELECTRON BEAM APPARATUS

Christopher Geoffrey Van-Essen, Beckenham, England; Erland Maxwell Schulson, Deep River, Ontario, Canada, and Richard Hugh Donaghay, Headington, England, assignors to Cambridge Scientific Instruments Limited

Filed Jan. 21, 1971, Ser. No. 108,408
Claims priority, application Great Britain, Jan. 21, 1970, 2,829/70; July 2, 1970, 32,059/70
Int. Cl. H01j *37/26*; G01n *23/22*
U.S. Cl. 250—49.5 A **4 Claims**

In electron probe apparatus modified or designed to display electron-channelling (pseudo-Kikuchi) effects by subjecting a point on a specimen surface to an electron beam scanned through a varying angle, the final lens of the beam forming system is employed as a deflection element in that an image of the source is formed in the plane of deflection means and that this plane and the specimen surface are made conjugate points

with respect to the final lens. To facilitate corrections for spherical aberration in the scanning, the scanning is preferably



performed on polar co-ordinates, with the beam sweeping out a conical path of slowly varying cone angle, and the result is displayed as a spirally scanned image.

3,702,399

SPECIMEN STAGE FOR AN ELECTRON MICROSCOPE

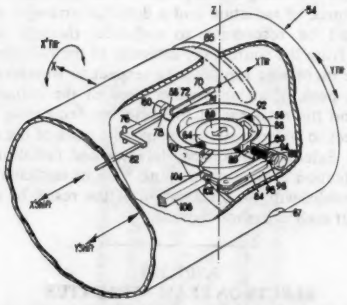
Jeffrey Harvey Lucas, nr. Saffron Walden, England, assignor to Associated Electrical Industries Limited, London, England

Filed Aug. 3, 1971, Ser. No. 168,615

Claims priority, application Great Britain, Aug. 4, 1970, 37,641/70

Int. Cl. H01j *37/20*

U.S. Cl. 250—49.5 B **9 Claims**



A specimen stage for an electron microscope which allows tilting and translation of the specimen. The translation does not shift the tilt axes. Thus, once the point of intersection of the tilt axes is aligned with the optical axis, it will remain aligned irrespective of subsequent translation of the specimen. Thus, tilting of the specimen will not affect the field of view. The stage comprises first and second gimbals, the second gimbal carrying a specimen mounting. The second gimbal can be translated with respect to the first gimbal along the second gimbal axis. The specimen mounting can be translated with respect to the second gimbal in a direction inclined to the second gimbal axis. In a preferred embodiment, the first gimbal is a tube, and the second gimbal is an annulus supported within the tube.

3,702,400

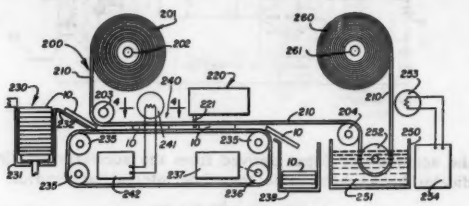
ADDRESSING APPARATUS

Ronald I. Morley, Berkeley, Calif.; Raymond W. Biernat, St. Paul, Minn., and Arnold J. Smidt-Hayer, Falls Church, Va., assignors to Dymo Industries, Inc., Berkeley, Calif.

Division of Ser. No. 643,718, June 5, 1967, Pat. No. 3,607,527. This application Feb. 18, 1971, Ser. No. 116,552

Int. Cl. B41l *45/00*

U.S. Cl. 250—65 T **9 Claims**



There is disclosed an addressing system including an addressing apparatus and addressing methods and materials used therein. A set of master cards is provided formed of porous tab card stock impregnated with a sensitizer vaporizable at 100° C. to 160° C. and having a selected area on one face thereof for the address in infrared absorbing ink; as disclosed, the master card is made by passing the porous tab card stock through a bath containing the sensitizer and a solvent therefor, after which the solvent is evaporated. The set of master cards is then employed to provide a master tape that is a strip of non-porous release material that is oleophobic and transparent to infrared radiation, and carrying thereon reverse reading copies of the addresses in the form of bodies of partially fused toner applied to one side of the master tape; the addresses are transferred from the master cards to the master tape utilizing a novel apparatus and method wherein a printing station is provided having a first source of infrared radiation thereat, first feed mechanism for feeding the master cards sequentially to the printing station and a second feed mechanism for feeding the master tape to the printing station to position a predetermined portion of the master tape immediately adjacent to the address on a master card positioned at the printing station, thereafter operating the first source of infrared radiation to vaporize from the master card sensitizer in areas corresponding to the address thereon onto the one surface of the master tape, applying a toner to the master tape to adhere toner to the sensitizer in areas corresponding to the address, and thereafter exposing the master tape carrying the powdered toner to a second source of infrared radiation for at least partially fusing the toner to provide a reverse reading copy of the address on the master tape. The toner comprises a vehicle body of wood rosin and polymerized resin, modifiers of polyamide resin and a hydrocarbon resin and pigment of carbon black. The master tape with the addresses thereon in partially fused toner is then fed to an addressing station where an envelop or other article to be addressed is placed with the surface thereof against the partially fused toner on a section of the master tape after which heat and pressure are applied thereto to transfer the bodies of toner to the envelope and fully to fuse the toner to provide on the envelope bodies of fully fused toner in areas corresponding to the address on a master card.

3,702,401

BRIDGE BALANCING CIRCUIT

William J. Parkin, Wayland, Mass., assignor to Sanders Associates, Inc., Nashua, N.H.

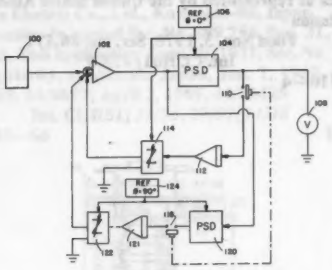
Continuation-in-part of Ser. No. 589,184, Oct. 19, 1966, abandoned. This application Nov. 22, 1968, Ser. No. 779,312

Int. Cl. H01j *39/12*

U.S. Cl. 250—210 **11 Claims**

A bridge balancing circuit is provided, in which errors in a bridge due to relatively slow changes in its parameters or in

environmental conditions are substantially eliminated. A receiving means is adapted for coupling to a bridge circuit having a signal source. The receiving means output is coupled



through an integrator to an impedance which varies in accordance with the integrator output to thereby balance the bridge with respect to a reference voltage level.

3,702,402

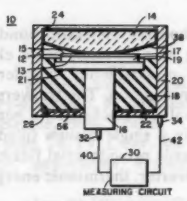
METHOD AND APPARATUS FOR LIGHT DETECTOR FABRICATION WITHOUT BRAZING

David F. Jacobs, Bethel Park, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 807,747, March 17, 1969, abandoned. This application March 2, 1971, Ser. No. 120,348

Int. Cl. H01j *39/12*

U.S. Cl. 250—216 **2 Claims**



This invention is a light detector assembly utilizing components maintained in operational relationship by compression assembly and without the use of mechanical bonding.

3,702,403

OPTICAL TESTING APPARATUS COMPRISING MEANS FOR FLOWING LIQUIDS IN FREE FALL CONDITION AT CONSTANT FLOW RATE

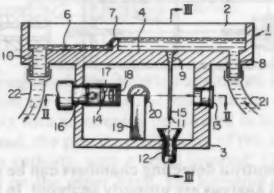
Hirotoshi Kishi, Tokyo, Japan, assignor to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1970, Ser. No. 78,112

Claims priority, application Japan, Nov. 15, 1969, 44/91172

Int. Cl. G01n *1/10, 21/06, 21/26*

U.S. Cl. 250—218 **10 Claims**



Improved photo-electric colorimeter possesses a flow system, wherein one part of a liquid to be measured falls at a constant flow rate defined substantially by a slit orifice for falling thereof and a weir for overflowing the remainder of the liquid, said falling liquid being transformed by a guiding means into a successive liquid film in a position between a light source and a photo-electric cell.

3,702,404

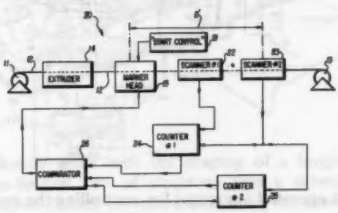
WIRE LENGTH COUNTER

Floyd P. McDermitt, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Filed June 29, 1971, Ser. No. 157,948

Int. Cl. G01b *7/04*

U.S. Cl. 250—219 LG **10 Claims**



This disclosure relates to a system for marking a continuously moving filament at predetermined intervals along its length comprising a marker head for applying retro-reflective indicia to the filament, and a photosensor disposed a predetermined distance from the marker head for sensing the indicia and actuating the marker head to apply subsequent indicia to the filament. In a modification of the system, a second photosensor and a counter permit the velocity of the filament to be monitored, and a comparator then compares successive velocity readings and computes the time interval required between successive applications of indicia, whereby the indicia are applied to the filament at substantially equal intervals of length irrespective of variations in the velocity of the filament.

3,702,405

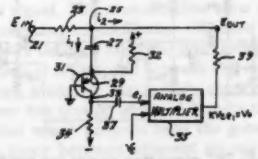
ELECTRONICALLY VARIABLE CAPACITANCE

Robert Zwirn, Encino; Ralph E. Johnson, Canoga Park, and Jacob M. Sacks, Palos Verdes Peninsula, all of Calif., assignors to The United States of America as represented by the Secretary of the Air Force

Filed Nov. 17, 1971, Ser. No. 199,684

Int. Cl. H03b *7/10*

U.S. Cl. 307—109 **3 Claims**

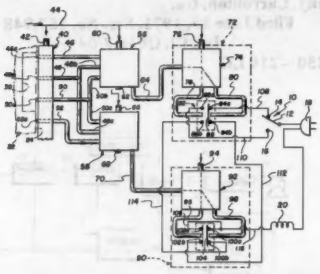


An electronically controlled capacitor utilizing an analog multiplier and to obtain an effect analogous to the Miller Effect. An input signal is fed through an input resistor which is connected to a fixed capacitor which is in turn coupled to a transistor in a common base configuration. An analog multiplier is capacitively coupled to the transistor's collector which drives the input side of the fixed capacitor through an output resistor.

3,702,406
FLUID OPERATED CONTROL APPARATUS RESPONSIVE TO SENSING A PLURALITY OF MEMBERS CONTAINING ONE OF TWO CODES

Gerald J. Sukel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 9, 1970, Ser. No. 88,033
Int. Cl. H01h *35/24*; F15c *1/08*
U.S. Cl. 307—144 5 Claims

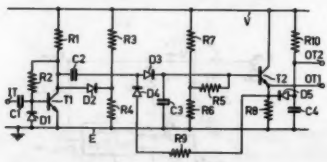


Fluid operated apparatus for controlling the operation of a device actuator that is connectable in an electric circuit and adapted to be energized in response to sensing of the presence of a particular coding on a film cartridge or other member. Fluid operated means senses the coding on a cartridge and selectively controls the application of fluid pressure to a fluid operated switch so that the switch is opened or closed according to the coding sensed. Electrical contacts of the switch are connectable in a circuit including the device to be controlled so that the device is operated only in response to the presence of a cartridge having a particular code thereon. In a preferred embodiment disclosed the apparatus is adapted to sense two particular cartridge codes and to operate a punch used to strip film from the cartridge only when a conditioning switch on a film processor indicates that the processor is set to handle the film type that is in the cartridge.

3,702,407
A CIRCUIT FOR CONVERTING A VARIABLE FREQUENCY PULSE TRAIN INTO A RELATED ELECTRIC VOLTAGE

Denis Sharp, East Grinstead, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 27, 1970, Ser. No. 58,349
Claims priority, application Great Britain, July 25, 1969, 37,575/69
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 7 Claims

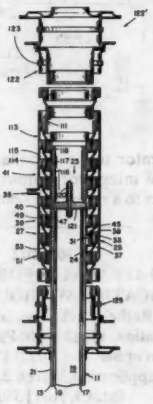


A frequency-to-DC converter circuit for producing an output voltage related to the frequency of a train of input pulses. The circuit includes an improved "diode pump" circuit in which the input capacitor discharges through a diode only to a given reference voltage different from ground potential during the period between successive input pulses. The reference voltage approximates the instantaneous voltage across the circuit storage capacitor. The output voltage is preferably taken from the junction of an RC time constant circuit. The converter is especially adapted to provide a speed signal in an anti-lock brake system.

3,702,408
MULTI-CONVERTER THERMIONIC ENERGY MODULE

Richard W. Longsderff, Lancaster, and Robert Shirk Sheetz, Elizabethtown, both of Pa., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Nov. 3, 1970, Ser. No. 86,577
Int. Cl. H01j *45/00*
U.S. Cl. 310—4 6 Claims

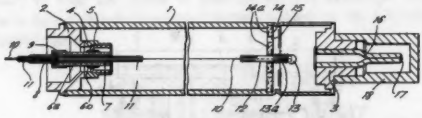


Vacuum-cast method for dielectric bonding of refractory metals for providing an aluminum oxide electrical insulator between concentric molybdenum cylinders for forming a trilayer sandwich construction. The trilayers are employed in thermionic diodes that are stacked on a heat pipe in a series connected network in a single cesium filled envelope. Interconnecting slotted leads provide axial flexibility between the diodes in a multi-converter, thermionic energy module.

3,702,409
NEUTRON COUNTER FILLED WITH BORON TRIFLUORIDE GAS

Anthony Goodings, Winfrith, and John Walgate Leake, Harwell, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed June 29, 1970, Ser. No. 50,762
Claims priority, application Great Britain, July 1, 1969, 33,290/69
Int. Cl. H01j *39/32*
U.S. Cl. 313—61 D 5 Claims

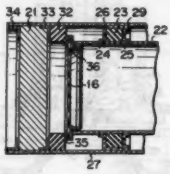


Failure of neutron detecting chambers can be avoided if the results of fault analysis are properly analyzed. In this invention the analysis leads to a redisposition, redesign and reorientation of ceramic components to avoid or delay their deterioration during use of the chamber.

3,702,410
IMAGE PICKUP TUBE SEMICONDUCTOR TARGET SUPPORT STRUCTURE

Shoichi Miyashiro, Yokohama; Shunji Shirouzu, Kawasaki, and Shigeo Tsuji, Fujisawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Continuation-in-part of Ser. No. 889,756, Dec. 31, 1969, abandoned. This application April 20, 1971, Ser. No. 135,710
Claims priority, application Japan, Jan. 7, 1969, 44/1181; Feb. 7, 1969, 44/8697; April 2, 1969, 44/25425
Int. Cl. H01j *31/28, 29/02, 31/38*
U.S. Cl. 313—66 11 Claims

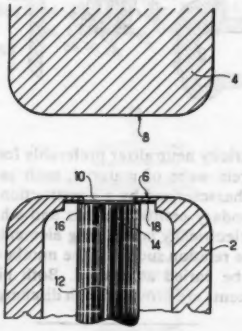


An image intensifier vidicon which is divided by a semiconductor target into an image section, the inner surface of the face plate of which is coated with an electron-emissive layer and a scanning section, wherein said semi-conductor target includes a semiconductor substrate, a plurality of PN junctions formed therein, an accelerating layer formed on the electron incident side of said target, and a scanning surface which is protected from contamination by alkali metals constituting the electron-emissive layer by means of insulation rings provided in the scanning section. One of the insulation rings also set the critical spacing between the target and a mesh electrode.

3,702,411
SPARK ARRESTER

Rene Destree, Viry-Chatillon, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed Sept. 14, 1971, Ser. No. 180,298
Claims priority, application France, Sept. 16, 1970, 7033577
Int. Cl. H01j *17/30*
U.S. Cl. 313—198 7 Claims

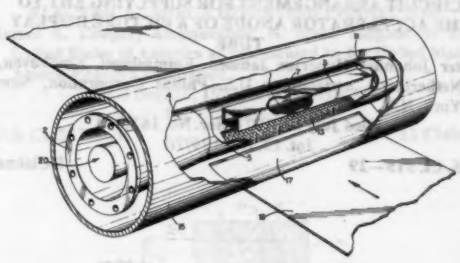


The triggering electrode is butted against an opening in the cathode, against the inside face of this cathode, closing a solid dielectric sheet with an opening perforated in it. This permits, on the one hand, the precise positioning of this electrode with respect to the cathode, with a small interval, 12 microns, for example, and on the other hand, the lowering of the voltage necessary to provide the pulse for the triggering. The invention applies particularly to rapid spark arresters where the triggering voltage is less than 2 kV.

3,702,412
APPARATUS FOR AND METHOD OF PRODUCING AN ENERGETIC ELECTRON CURTAIN

Bertram S. Quintal, Peabody, Mass., assignor to Energy Sciences, Inc., Burlington, Mass.

Filed June 16, 1971, Ser. No. 153,769
Int. Cl. H01j *33/00, 33/04, 1/46*
U.S. Cl. 313—299 7 Claims

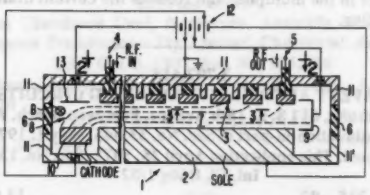


This disclosure deals with the shaping of a longitudinal space-charge-limited line of electrons into a substantially uniform electron density curtain, accelerating the same along field lines that expand the curtain, and then passing the expanded curtain through a longitudinal window for irradiation purposes and the like.

3,702,413
SHIELDED MEANDER LINE SLOW WAVE CIRCUIT AND TUBES USING SAME

Bernard S. Glance, Berkely Heights, N.J., assignor to Varian Associates

Filed Jan. 26, 1968, Ser. No. 700,897
Int. Cl. H01j *25/34*
U.S. Cl. 315—3.5 5 Claims



A crossed field microwave amplifier tube is disclosed. The amplifier employs a meander line slow wave circuit arranged for interaction with a stream of electrons to amplify signal radio frequency wave energy on the circuit to produce an amplified output signal. The meander line slow wave circuit includes a zig-zag shaped conductor disposed over a ground plane member to define a meander line slow wave circuit. An insulative structure is disposed between the zig-zag conductor and the ground plane for insulatively supporting the zig-zag conductor over the ground plane. A conductive shield structure is provided which projects from the ground plane structure into the space between adjacent zig-zag portions of the zig-zag shaped conductor to decrease the capacitance between adjacent zig-zag portions of the meander line, thereby shaping the dispersion characteristic of the shielded meander line circuit to provide nearly constant phase velocity for r.f. wave energy within an ultra wide passband of the circuit. More particularly, the phase velocity within the passband of the circuit is constant to within 1 percent for 1 octave of bandwidth and constant to 1.5 percent for a 2 octave bandwidth. In a preferred embodiment, the insulative support structure is recessed into the ground plane structure to reduce

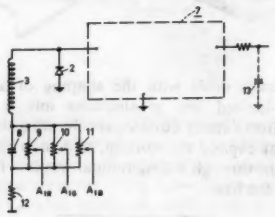
the shunt capacity of the meander line to the dielectric support structure, thereby reducing the insertion loss of the circuit. In addition the conductive shield structure serves to shield the insulative support structure from sputtered cathode materials which would otherwise tend to be deposited on and to short out the insulative structure.

3,702,414

CIRCUIT ARRANGEMENT FOR SUPPLYING EHT TO THE ACCELERATOR ANODE OF A PICTURE DISPLAY TUBE

Peter Johannes Hubertus Janssen, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed July 15, 1971, Ser. No. 163,013
Int. Cl. H01j *29/70*
U.S. Cl. 315—29 **5 Claims**



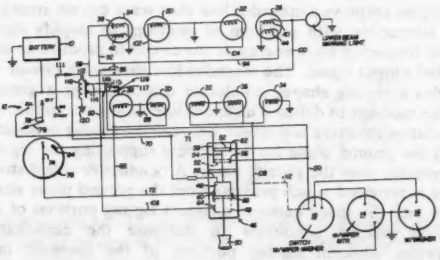
A circuit has a horizontal output transformer with an output winding. A voltage multiplier is connected to the winding to provide the voltage to a CRT ultor electrode. In addition, a diode has its cathode connected to the junction of the multiplier and the winding and its anode grounded. This supplies the voltages for the acceleration anodes without using a large capacitor in the multiplier and reduces the current drain from the winding.

3,702,415

SAFETY AUTOMOTIVE LIGHTING CIRCUITS

Rudd Schultz, 611 S. E. 18th Avenue, Pompano Beach, Fla.

Continuation-in-part of Ser. No. 33,645, May 1, 1970, abandoned. This application April 28, 1971, Ser. No. 138,127
Int. Cl. B60g *1/02*
U.S. Cl. 315—82 **11 Claims**



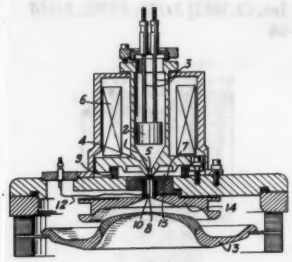
An improved circuit in an automotive vehicle associated with the light switch and the ignition switch of the vehicle to turn on the vehicle's headlamps along with or instead of its parking lamps when the light switch is in its parking lamp activating position and the vehicle is in an operating condition.

3,702,416

ION SOURCE HAVING A UNIFORM RADIAL DENSITY

Lucien Bex, 8, residence des Fougeres, 78 Les Clayes-sour-Bois; Jean Faure, Residence Les Amazones, 78 Les Essarts-le-Roi, and Roger Vienet, 4 avenue des Roches, 91 Gif-Sur-Yvette, all of France

Filed March 27, 1970, Ser. No. 23,184
Claims priority, application France, April 4, 1969, 6910569
Int. Cl. H01j *7/24*
U.S. Cl. 315—111 **4 Claims**



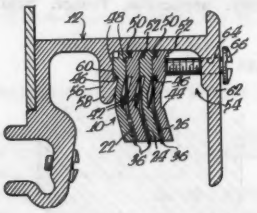
The source comprises an ionization chamber into which the gas to be ionized is introduced, a cathode placed at the center of an intermediate electrode provided within an orifice for the passage of electrons, an anode provided with a hole for the passage of ions, a plasma-expansion control electrode which is electrically insulated from the anode and brought to a negative potential with respect to the anode potential, and an ion extraction electrode.

3,702,417

STATIC ELIMINATOR

Kenneth W. Bower, Des Plaines, and Lewis F. Jennings, McHenry, both of Ill., assignors to Varco Incorporated

Filed Oct. 15, 1971, Ser. No. 189,639
Int. Cl. H05f *3/04*; H01t *19/04*
U.S. Cl. 317—2 F **11 Claims**



A static electricity neutralizer preferably for use in business machines wherein webs of material, such as paper, are fed therethrough characterized by a construction that eliminates undesired secondary emitting points and wherein insulating members and electrically conducting elements are stacked in a sandwich type relation such that the number of layers in the sandwich can be varied as desired. Both high voltage and grounding elements are provided with discharge points.

3,702,418

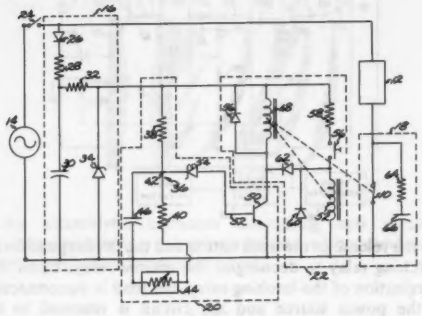
PROTECTION SYSTEM WITH MANUAL RESET MEANS OPERABLE ONLY ON CLEARING OF THE FAULT

Robert E. Obenhaus, South Easton, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 30, 1971, Ser. No. 185,103
Int. Cl. H02h *5/04*
U.S. Cl. 317—13 A **16 Claims**

A protection system is provided for effecting disruption of the power being supplied to a load responsive to a sensed

variation in the operation of a system being protected and for preventing re-application of power to the load until the fault dissipates. The system includes a first selectively operable switch means for connecting and disconnecting the load from a source of power and a switch control means operatively connected to the switch means for effecting opening and closing thereof so as to effect removal and re-application of power to the load, respectively responsive to energization and de-energization thereof. The switch control means remains in an energized condition subsequent to energization due to the



establishment of a magnetic bias until neutralization of the magnetic bias is effected. A selectively energizable current switch is coupled to the switch control means for controlling its operation, while means responsive to the operation of the system being protected are coupled to the current switch for controlling conduction thereof responsive to predetermined variations in the operation of the system being protected. In addition, selectively operable means are coupled to the switch control means for effecting neutralization of the magnetic bias only when the current switch returns to a non-conductive condition.

3,702,419

LIGHTNING ARRESTER WITH PRESSURE RELIEF MEANS

Charles H. Carothers, and Philip W. Bogner, Bloomington, both of Ind., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 28, 1971, Ser. No. 184,471

Int. Cl. H02h *1/04, 9/06*

U.S. Cl. 317—61 **9 Claims**

A lightning arrester with means for relieving internal pressure by venting the housing in case of failure of the arrester. The housing is closed at the end by a thin sealing plate and a piercing member is disposed inside the housing adjacent the plate. An explosive disconnector device is provided on the outside of the housing, and in case of failure of the arrester the disconnector operates and drives the plate onto the piercing member to puncture the plate and relieve internal pressure in the housing.

3,702,420

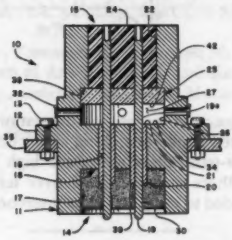
ELECTRICAL SURGE DIVERTING CONNECTOR

James A. Cooper, Albuquerque, N. Mex., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 21, 1971, Ser. No. 210,370

Int. Cl. H02h *9/04*

U.S. Cl. 317—61 **11 Claims**



An electrical connector which provides lightning protection by facilitating arcing of electrical surges over the end of an insulator and cooperating conductive surface employing dielectric to stimulate arc-over and thus substantially reduce breakdown voltage.

3,702,421

CHOKE UNIT

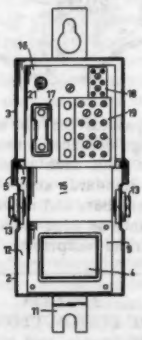
Andries Theodorus Grul, Northryde, Australia, assignor to Ferguson Transformers Pty. Limited, Chatswood, Australia

Filed Oct. 5, 1971, Ser. No. 186,286

Claims priority, application Australia, Oct. 6, 1970, 2764/70

Int. Cl. H02b *1/18*; H01f *15/02*

U.S. Cl. 317—99 **9 Claims**



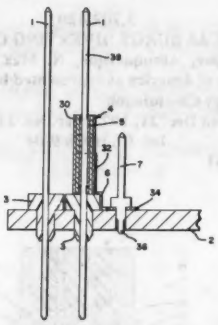
An electric choke is embedded in a sealing compound filling part of a metal housing acting as a heat sink. The core of the choke has a support member fixed therein, which extends beyond the sealing compound and supports ancillary equipment.

3,702,422

FILTERS FOR INTERCONNECTION SYSTEMS

Ferdinand William Schor, Altadena, Calif., assignor to AMP Incorporated, Harrisburg, Pa.

Filed June 10, 1971, Ser. No. 151,788
Int. Cl. H05k 1/04
U.S. Cl. 317—101 CC 9 Claims



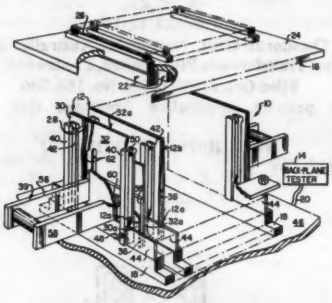
An interconnection system configuration which is used between a printed circuit board and wiring board circuitry and which uses low-pass filters to reduce high frequency interference. The filters are positioned over terminal posts and uniquely grounded to the panel of an interconnection system.

3,702,423

LOW-FORCE PRINTED CIRCUIT MALE CONNECTION APPARATUS

Walter Kern, Cohasset, Mass., assignor to Teradyne, Inc., Boston, Mass.

Filed Nov. 9, 1971, Ser. No. 196,903
Int. Cl. H05k 1/00
U.S. Cl. 317—101 D 11 Claims



Printed circuit apparatus has the circuit board structure which carries the edge contacts constructed with two sheet members in register with each other and having a total thickness less than standard, and with a wedge member between the sheet members and movable to separate them, after plugging them into an edge-receiving receptacle, to the thickness standard for the receptacle.

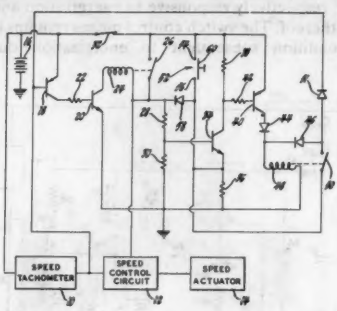
3,702,424

ELECTRONIC PUSH BUTTON SEQUENCER

Ronald L. Colling, Millington, and Myron U. Trenne, Flint, both of Mich., assignors to General Electric Corporation, Detroit, Mich.

Filed May 20, 1971, Ser. No. 145,274
Int. Cl. H01h 47/04
U.S. Cl. 317—140 2 Claims

A push button sequencer in which a latching relay is energized and latched, in response to the actuation of a push button, to connect a load to a power source. Upon the release of the push button, a control circuit senses the energization of the latching relay and the release of the push button to energize a second relay which connects the output of the push button to a circuit for deenergizing the latching relay. A subsequent actuation of the push button supplies a signal to the circuit to deenergize the latching relay. The control circuit



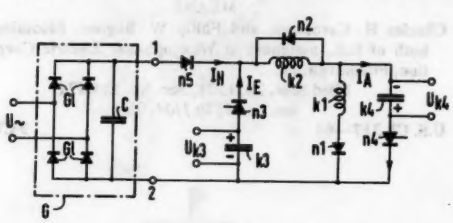
senses the release of the push button and the deenergization of the latching relay to deenergize the second relay. Upon the deenergization of the latching relay, the load is disconnected from the power source and the circuit is returned to its original condition such that the next actuation of the push button will again energize and latch the latching relay to supply power to the load.

3,702,425

CIRCUIT FOR RAPID EXCITATION AND DE-EXCITATION OF AN ELECTROMAGNETIC SWITCH

Manfred Hoffmann, Erlangen, and Peter Schulze, Uttenreuth, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Dec. 13, 1971, Ser. No. 207,004
Claims priority, application Germany, Dec. 18, 1970, P 20 62 387.4
Int. Cl. H01h 47/22
U.S. Cl. 317—151 10 Claims



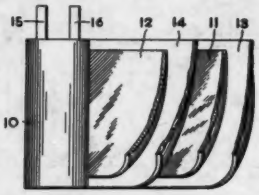
For rapid excitation and de-excitation of electromagnetic switches, such as relays, contactors, magnetic valves, and the like, the excitation winding of an electromagnetic switch is passed by a steady holding direct current via a choke connected in series therewith. The holding current is adequate for holding the armature when the armature is pulled up, but is inadequate for pulling up the armature from its rest position. A first series circuit arrangement connected in parallel with the series connection of the excitation winding and the choke comprises a first controllable semiconductor switch and a first capacitor. A second series circuit arrangement connected in parallel with the excitation winding comprises a second controllable semiconductor switch and a second capacitor. The first series circuit arrangement produces a pulse-like current amplification of the holding current in the excitation winding when its semiconductor switch is controlled. The second series circuit arrangement produces a pulse-like current reduction of the holding current in the excitation winding when its semiconductor switch is controlled.

3,702,426

DIMETHYLOLPROPIONIC ACID BASED ELECTROLYTES FOR ELECTRICAL CAPACITORS

Sidney D. Ross; Franz S. Dunkl, both of Williamstown, and Manuel Finkelstein, North Adams, all of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Dec. 3, 1971, Ser. No. 204,481
Int. Cl. H01g 9/00
U.S. Cl. 317—230 9 Claims



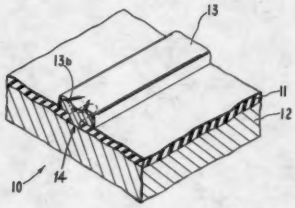
An electrolytic capacitor containing new electrolyte systems comprising a solvent containing a compound derived from α, α-dimethylolpropionic acid:

3,702,427

ELECTROMIGRATION RESISTANT METALLIZATION FOR INTEGRATED CIRCUITS, STRUCTURE AND PROCESS

Arthur J. Learn, Cupertino; William H. Shepherd, and Conrad J. Dellioca, both of Palo Alto, all of Calif., assignors to Fairchild Camera Instrument Corporation, Mountain View, Calif.

Filed Feb. 22, 1971, Ser. No. 117,477
Int. Cl. H01l 3/00, 5/00
U.S. Cl. 317—234 R 6 Claims



The exposed surfaces of metal leads formed on an integrated circuit wafer are anodized to reduce electromigration.

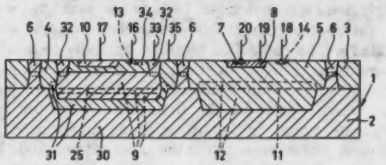
3,702,428

MONOLITHIC IC WITH COMPLEMENTARY TRANSISTORS AND PLURAL BURIED LAYERS

Albert Schmitz; Cornelis Mulder, and Arie Slob, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 18, 1967, Ser. No. 676,235
Claims priority, application Netherlands, Oct. 21, 1966, 6614858
Int. Cl. H01l 19/00
U.S. Cl. 317—235 R 14 Claims

A method of making, and the product resulting, an integrated monolithic circuit having complementary transistors in islands formed in an epitaxial layer of opposite conductivity on a one-type substrate. One transistor, usually the NPN, is conventional. The other transistor, PNP, uses a diffused emitter, a base region formed by the island material, and a collector comprising a buried layer formed in the epitaxial layer by outdiffusion from the substrate. To isolate the collector, a



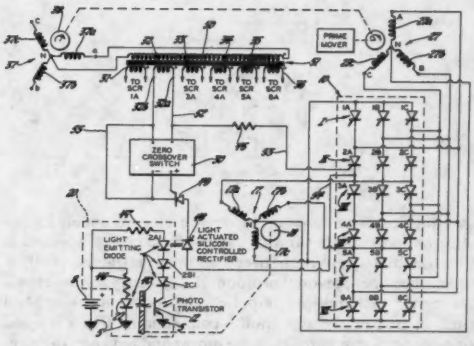
second buried layer can be provided forming part of a tub-shaped isolation region surrounding the collector.

3,702,429

CYCLOCONVERTER SILICON CONTROLLED RECTIFIER GATE-CATHODE CIRCUIT SIGNAL AND POWER SYSTEM

Elbert M. Sawyer, Torrance, Calif.; Joseph M. Brown; Curtis D. Munden, both of Anderson, Ind., and Kenneth E. Giles, Corvallis, Oreg., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 30, 1971, Ser. No. 203,276
Int. Cl. H02p 5/40
U.S. Cl. 318—227 5 Claims



A system for producing properly timed gate signals and gate-cathode power for the silicon controlled rectifiers of a cycloconverter network, through which the phase windings of a three-phase alternating current motor are cyclically energized from an alternating current supply potential alternator, having two groups of three silicon controlled rectifiers for each motor phase winding. The properly timed gate signals are produced by a rotor position sensor including six circumferentially arranged phototransistors, each of which corresponds to a group of cycloconverter silicon controlled rectifiers, an axially aligned and spaced light-emitting diode corresponding to each phototransistor, a shutter disposed therebetween and rotated by the motor rotor of a configuration such that pairs of phototransistors are alternately exposed to and masked from the corresponding light-emitting diodes and three gate signal light-emitting diodes connected in series with each phototransistor across a direct current potential source. When any pair of phototransistors is exposed to the corresponding light-emitting diodes, a circuit is completed for the three gate signal light-emitting diodes in series with each. Each gate signal light-emitting diode produces a gate signal for a respective silicon controlled rectifier of the group to which the phototransistor with which it is connected in series corresponds. The gate-cathode circuit of each cycloconverter silicon controlled rectifier of each group is transformer coupled to a different phase output winding of a gate power three-phase alternating current alternator, mechanically coupled to

and operated by the alternating current supply potential alternator, which produces a gate-cathode power potential which leads the alternating current supply potential alternator potential by a selected electrical angle. Included in each cycloconverter silicon controlled rectifier gate-cathode circuit are a light actuated silicon controlled rectifier, optically coupled to a corresponding gate signal light-emitting diode, and a gate-cathode circuit silicon controlled rectifier which are triggered conductive, respectively, by the light emitted by the corresponding gate signal light-emitting diode and the output signal of a zero crossover switch in the same gate-cathode circuit to complete the gate-cathode circuit for the corresponding cycloconverter silicon controlled rectifier.

3,702,430

CONTROL DEVICE FOR ELECTROMECHANICALLY OPERATED CLOSURE PANELS

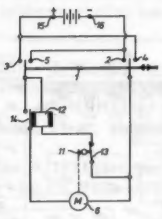
Hans Knetsch, Penzberg, Germany, assignor to Webasto-Werke W. Baier KG, Stockdorf, Germany

Filed Dec. 20, 1971, Ser. No. 209,613

Claims priority, application Germany, Jan. 5, 1971, P 21 00 336.1

Int. Cl. G05d *3/00*; H02p *3/06*

U.S. Cl. 318—468 **8 Claims**



A control device for a motor-driven closure panel, for instance an automobile sunroof panel whose closed position is an intermediate position between an open, retracted position and another open, pivoted position, the circuitry for the reversible motor including an impulse relay operating a control switch in one of the two motor connections, the relay coil being connected in parallel to the motor and between the control switch and the pole reversing switch, a position-responsive switch cutting off the relay circuit whenever the panel moves out of its closed position and energizing the impulse relay whenever the panel reaches the closed position.

3,702,431

CONDITION RESPONSIVE MODULATING MOTOR CONTROL SYSTEM

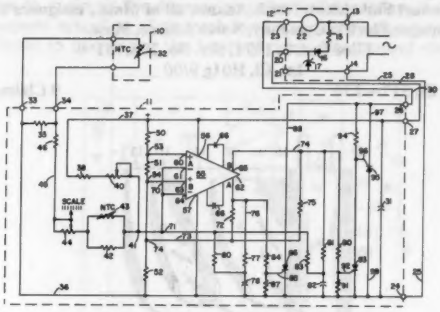
Balthasar Hubert Pinckaers, Edina, Minn., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Dec. 3, 1971, Ser. No. 204,567

Int. Cl. G05b *11/01*

U.S. Cl. 318—471 **6 Claims**

A condition responsive circuit, disclosed as including two temperature responsive elements, is adapted to be connected to a pair of identical amplifiers which are biased to different operating levels. The amplifiers each have outputs that are connected to different silicon controlled rectifiers that are in turn connected in an inverse parallel relationship. Each of the pair of amplifiers further includes a positive feedback circuit to its respective input, and a time delayed negative feedback circuit connected to its respective input. An electric motor is connected in series with an alternating current supply and a pair of silicon controlled rectifiers so that the motor can be controlled. The motor is of a type that operates in a first direction when energized by a full-wave alternating potential to load a resilient means, such as a spring. The resilient means or spring is capable of returning the motor and load in the opposite direction when energy is removed from the motor. The motor is capable of being stalled and maintained in any intermediate position by the application of unidirectional half-wave potential.



3,702,432

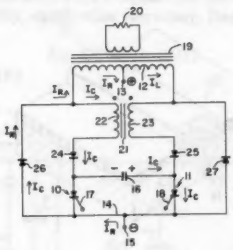
INVERTERS USING CONTROLLED SEMICONDUCTOR RECTIFIERS

John W. Wurst, Dover, and Robert M. Kanen, Long Valley, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Aug. 21, 1969, Ser. No. 851,831

Int. Cl. H02m *7/52*

U.S. Cl. 321—45 R **1 Claim**



A parallel D.C. to A.C. inverter uses triggered silicon controlled rectifiers (SCR's) in a power current flow circuit especially adapted to supply variable frequency currents to an induction motor load over a wide range of frequency, voltage and load power. A bifilar choke is used to prolong the discharge time of the commutating capacitor and to prevent high peak currents to the load during commutation. A first pair of diodes prevents discharge of the capacitor prior to commutation. A second pair of diodes provides alternate feedback paths for the return of energy stored in the magnetic circuit to the power supply immediately after commutation.

3,702,433

ALTERNATOR REGULATOR CIRCUIT

Forbes D. Gilchrist, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

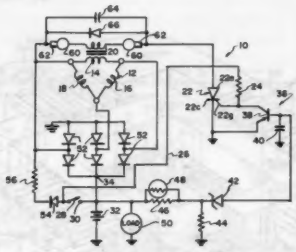
Filed Feb. 25, 1971, Ser. No. 118,911

Int. Cl. H02p *9/30*

U.S. Cl. 322—28 **5 Claims**

An alternator regulator is arranged to control field excitation current when receiving such excitation current from one

of the three phase stator windings which form the output of the alternator. Starting current to the excitation field winding is supplied through a resistor, and after initiation of operation of the alternator, continued excitation of the field winding is achieved by the output of the alternator itself. A silicon controlled rectifier is connected in series with the excitation field winding to control current therethrough and the gate current to the silicon controlled rectifier is supplied by a direct connection to the alternator output or a battery supply connected thereto.

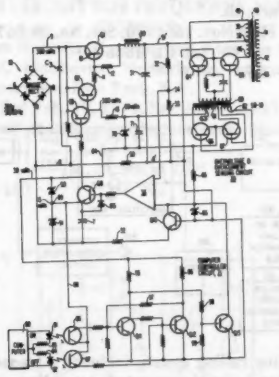


3,702,434

POWER SUPPLY SYSTEM AND CONTROL CIRCUITS THEREFOR

William H. Ryan, Toledo, Ohio, assignor to Owens-Illinois, Inc.

Filed Dec. 18, 1970, Ser. No. 99,497
Int. Cl. G05f 1/44
U.S. Cl. 323—20 **4 Claims**



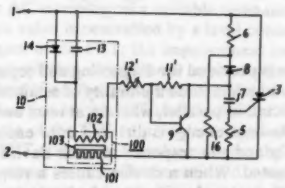
There is disclosed a regulated power supply system wherein an alternating current supply voltage is converted to a direct current voltage, which is regulated and applied to a converter, the converter including a pair of switching transistors for switching current through a linear transformer core and a further pair of switching transistors connected as a push-pull saturable reactor oscillator or inverter for supplying switching potentials to the first pair of transistors. A zener reference diode is used to sense over-voltage conditions to a load and automatically adjust a switching transistor in the regulator to adjust the voltage to the load. In accordance with the invention, one or more switching devices are connected across the zener diode, one of which is operated in accordance with signals from a computer or other low level signal source so as to turn on and turn off the power supply and the other of which is connected to a current sensing resistor for shunting the reference zener diode on current overloads. A further feature of the invention is in the overall system of conversion wherein power for the saturable reactor inverter and other operating potentials for the regulating circuit are derived from the regulator circuit per se, thereby improving the efficiency of the system.

3,702,435

ELECTRIC POWER CONTROL DEVICE

Yoshitaka Endo; Katsumi Tomiyama, both of Kamakura, and Yasushi Takanashi, Nitta-gun, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1971, Ser. No. 110,229
Claims priority, application Japan, Jan. 31, 1970, 45/8849
Int. Cl. G05f 1/44; H03k 17/00
U.S. Cl. 323—22 SC **2 Claims**



The disclosed electric power control device utilizes a semiconductor control device and a capacitor. The capacitor is so arranged to be charged during a voltage in the reverse direction applied to the semiconductor control device, and to discharge through a control electrode of the control device when the forward voltage applied to the semiconductor control device is zero or when the voltage exhibits reverse polarity, thereby to switch the semiconductor control device at a zero crossing point of the a.c. voltage from the source.

3,702,436

METHOD AND APPARATUS FOR DATA SIGNAL SPECTRUM ANALYSIS

Billy G. Pollard, San Diego, Calif., assignor to Spectral Dynamics Corporation of San Diego

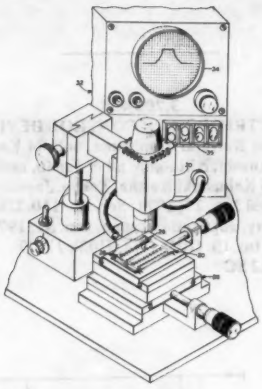
Filed Oct. 26, 1971, Ser. No. 192,492
U.S. Cl. 324—77A **19 Claims**

The processing of a data signal for analysis by using a time scale converter that changes the time base or function of the data signal supplied to a single band filter that filters frequencies of interest. The changing of the time base in multiple steps and in successive time intervals, presents different frequencies of the data signal to the filter in the filters constant narrow band. The process and apparatus uses a recirculating memory with a time scale that is changed to allow a programmed change in the speed of recirculation. This allows a single band filter or a single degree of freedom filter to in effect scan the range of frequencies of the complex data input signal, even though the signal is transient and not reoccuring.

3,702,437
DIAGNOSTIC AND REPAIR SYSTEM FOR SEMICONDUCTORS

John W. McGrath, Allentown, Pa., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,176
Int. Cl. G01r 31/22, 31/02
U.S. Cl. 324—158 F 11 Claims



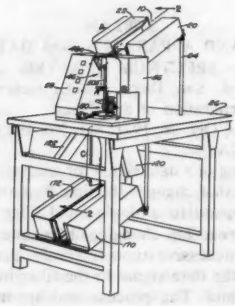
A system is provided for diagnosing and repairing electronic assemblies which include a plurality of semiconductor devices interconnected in parallel, wherein at least one of the devices is faulty. Radiant energy is directed onto each of the devices successively and the response of each device to the radiant energy is noted. When a device causes a response dissimilar from the others it is identified as a faulty device and replaced.

Alternatively, disturbing energy is transferred to the devices from a remote source by capacitive or inductive coupling through electric and magnetic fields respectively.

3,702,438
DIODE TESTER

Everett N. Cole, Jr., Tewksbury, Mass., assignor to Consolidated Design, Inc., Lowell, Mass.

Filed Dec. 23, 1969, Ser. No. 887,711
Int. Cl. G01r 31/22; B65g 11/20
U.S. Cl. 324—158 F 16 Claims

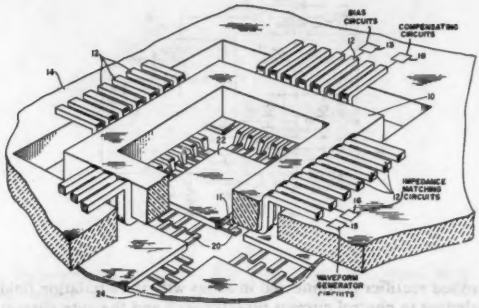


A diode handler magnetically orients diodes fed to it in random orientation, supplies them one at a time to a test station, and stacks them, after testing, with their anodes pointed in the same direction.

3,702,439
LOW IMPEDANCE FIXED POINT TEST PROBE

Bruce Hamilton McGahey, South Plainfield, and John Wesley West, Millington, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 12, 1970, Ser. No. 63,232
Int. Cl. G01r 31/22, 31/02
U.S. Cl. 324—158 P 4 Claims

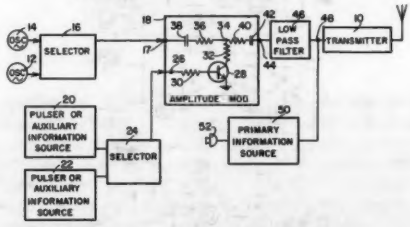


A test probe includes a picture frame insulator support member on which relatively short cantilever beam-like members are mounted. One end of each of the cantilever beam-like members is used as a probe to contact a beam lead or bonding pad of an integrated circuit chip which is part of a semiconductor wafer. The probe's geometry, the material used for its construction, and the close proximity of the insulator support member to the integrated circuits to be tested all contribute to the low impedance of the probe and the sliding contact-type action which occurs during the probing operation.

3,702,440
SELECTIVE CALLING SYSTEM PROVIDING AN INCREASED NUMBER OF CALLING CODES OR AUXILIARY INFORMATION TRANSFER

George G. Moore, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 16, 1970, Ser. No. 89,867
Int. Cl. H04b 1/16
U.S. Cl. 325—55 15 Claims

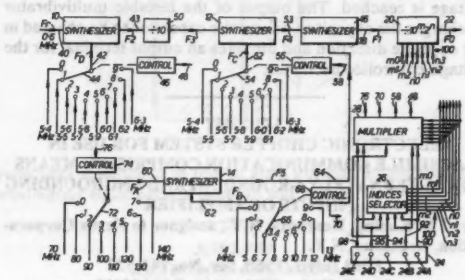


The selective calling system includes a transmitter having first and second signal generators providing sinusoidal and rectangular signals which are combined to form a modulated calling signal. Each receiver of the system includes a first demodulator which demodulates the modulated calling signal and a second demodulator which demodulates the rectangular signal. A frequency selective device connects the first demodulator to a first input of an AND gate and a repetition rate selective device connects the second demodulator to a second input of the AND gate. If the demodulated frequency and repetition rate are within the passbands of the devices, the AND gate provides a turn-on signal which allows primary information to be reproduced by the receiver. The system can be modified so that auxiliary information is transferred to the receivers by the calling signal.

3,702,441
FREQUENCY SYNTHESIZING SYSTEM

Keith R. Thrower, Bracknell, England, assignor to Racal Instruments Limited, Windsor, Berkshire, England

Filed Sept. 30, 1971, Ser. No. 185,261
Claims priority, application Great Britain, Oct. 2, 1970, 46,866/70
Int. Cl. H03b 19/00
U.S. Cl. 328—14 10 Claims

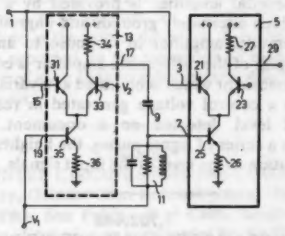


A frequency synthesizing system includes frequency synthesizing means operative to produce an adjustable intermediate frequency, frequency dividing means for dividing the intermediate frequency by an adjustable division factor to produce an output frequency, setting means operable to set up the desired value of the output frequency, and control means automatically responsive to the setting means to adjust the synthesizing means and the dividing means in dependence on the desired value of the output frequency, such that the value of the intermediate frequency produced by the synthesizing means produces, when divided by the division factor of the dividing means, the desired output frequency.

3,702,442
DETECTION CIRCUIT FOR FREQUENCY-MODULATED SIGNALS

Peter Johannes Hubertus Janssen, and Kian Kie Ong, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1971, Ser. No. 116,923
Claims priority, application Netherlands, March 7, 1970, 7003280
Int. Cl. H03d 3/00
U.S. Cl. 329—103 6 Claims

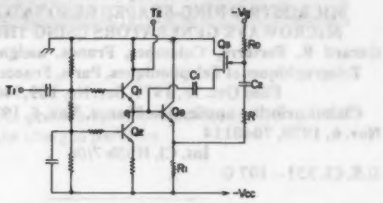


Interfering phase modulation of the current passage through an FM- quadrature demodulator as a result of amplitude modulation of the input signal is compensated by using a circuit which converts amplitude modulation of the input signal into phase modulation corresponding to the interfering phase modulation.

3,702,443
AUDIO-FREQUENCY SIGNAL LEVEL CONTROL CIRCUIT

Takatoshi Okumura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki, Kaisha, Hamamatsu-shi, Japan

Filed Jan. 27, 1971, Ser. No. 110,041
Int. Cl. H03g 3/30
U.S. Cl. 330—28 5 Claims

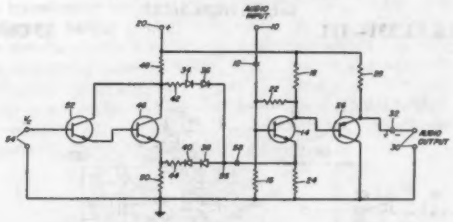


In an audio signal level control circuit for use in an audio system such as an electronic musical instrument, which comprises an emitter-grounded type transistor amplifier, an input signal being applied to the base and an output signal being taken out from the collector, a constant-current supply circuit including another transistor and being connected in series in the emitter path of the amplifier, and a field effect transistor (FET) connected between the emitter of the amplifier and the ground from an AC viewpoint as a variable resistance element whose resistance value is controlled by a level control voltage applied to the gate of the FET; the improvement comprises a unidirectional amplifying circuit such as an emitter follower type transistor amplifier, the base of which being connected to the non-grounded side of the FET and the emitter being connected to the gate of the FET to provide a negative feedback function of the FET operation, thereby reducing the distortion in the output signal of the first-mentioned amplifier and eliminating the generation of noises due to rough variation of the control voltage.

3,702,444
VOLTAGE-CONTROLLED VARIABLE GAIN AMPLIFIER

Thomas P. Owen, New York, N.Y., assignor to Columbia Broadcasting System, Inc.

Filed March 19, 1971, Ser. No. 125,994
Int. Cl. H03g 3/30
U.S. Cl. 330—28 2 Claims



A transistorized voltage-controlled variable-gain audio amplifier including a transistor connected as a common-emitter amplifier, and a control circuit coupled to the emitter of the amplifying transistor and operative in response to a direct control signal to vary the impedance at the emitter without changing the voltage thereat. The control circuit includes a second transistor having matched collector and emitter resistors connected to a source of energizing potential and to ground respectively, and a branch circuit including at least two forward-biased semi-conductor diodes connected in series between the collector and emitter of the transistor. The junction between the diodes is connected through a capacitor to the emitter of the amplifying transistor thereby to effectively

connect the impedance of the branch circuit in parallel with the emitter resistor of the amplifying stage. A direct control voltage applied to the base of the control transistor varies the current through the diodes to vary their impedance, and consequently the impedance at the emitter of the amplifying transistor, without changing the voltage at the emitter, to thereby vary the gain of the amplifying stage.

3,702,445

MICROSTRIP RING-SHAPED RESONATORS AND MICROWAVE GENERATORS USING THE SAME

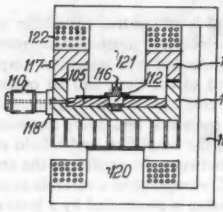
Gerard E. Forterre, Colombes, France, assignor to Lignes Telegraphiques et Telephoniques, Paris, France

Filed Oct. 18, 1971, Ser. No. 189,946

Claims priority, application France, Nov. 6, 1970, 7040113; Nov. 6, 1970, 7040114

Int. Cl. H03b *7/06*

U.S. Cl. 331—107 G **5 Claims**



A microwave resonator comprising an insulating substrate plate with a metallized coating entirely covering one of its faces and a metallized ring on its other face, and a microstrip transmission line on the same plate capacitively coupled with said ring. Microwave generators using such a resonator for determining their working frequency and having a Gunn diode located in the central hole of the ring are also described. The substrate plate can be made of a non-magnetic material or, if a variable frequency is desired, of a magnetic material adjustably polarized by D.C. field producing means.

3,702,446

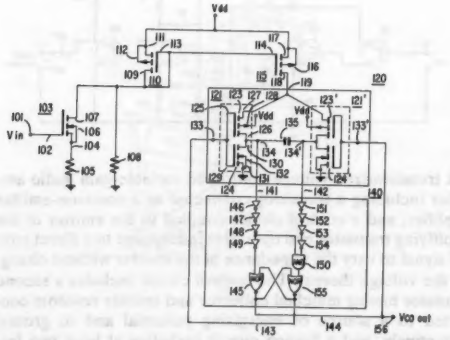
VOLTAGE-CONTROLLED OSCILLATOR USING COMPLEMENTARY SYMMETRY MOSFET DEVICES

Goetz Wolfgang Steudel, Flemington, N.J., assignor to RCA Corporation

Filed Sept. 7, 1971, Ser. No. 178,331

Int. Cl. H03k *3/282*

U.S. Cl. 331—111 **23 Claims**



A voltage-controlled oscillator that is compatible with integrated circuit techniques and comprises complementary symmetry MOSFET devices to provide linear operation over several frequency decades, and exhibits high input impedance and minimum power consumption. The frequency of operation is controlled by a current source which is controlled solely by an input voltage. The constant current source linearly charges a capacitor through a bridge circuit. The bridge circuit which includes two complementary MOSFET transistors in each arm is connected across the current source and arranged so that when one transistor in an arm switches on the diagonally opposite transistor, in the other arm, also switches on. The rising voltage across the capacitor is used to change the state of a bistable multivibrator when a given threshold voltage is reached. The output of the bistable multivibrator discharges the capacitor, causes the capacitor to be charged in the opposite direction and provides an output terminal for the voltage-controlled oscillator.

3,702,447

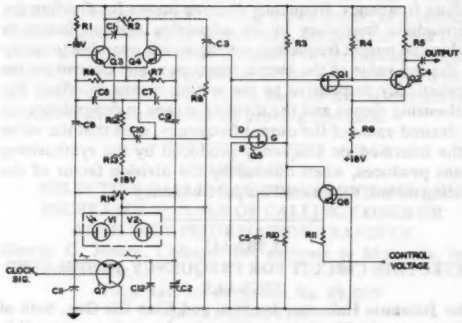
ELECTRONIC CHOPPER SYSTEM FOR USE IN FACSIMILE COMMUNICATION COMPRISING MEANS FOR ALTERNATELY GROUNDING AND UNGROUNDING INPUTS OF AMPLIFIER

Virgil H. Koning, Henrietta, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed July 1, 1968, Ser. No. 741,537

Int. Cl. H03c ; H04n *3/16;* **H01j** *39/12*

U.S. Cl. 332—3 **10 Claims**



An electronic chopper circuit for use in converting variable amplitude direct current signals to pulsed signals of similar characteristics. In conjunction with a facsimile scanning system, the modulated electrical signals generated by a photoelectric cell are applied to a differential amplifier after periodic interruption by the electronic chopping circuit in accordance with an input clock signal. The periodic interruption to the differential amplifier is provided by a dual emitter transistor which alternately grounds and ungrounds the input to the differential amplifier in response to an input clock signal. The gain of the differential amplifier is controlled by a field effect transistor which is operated as a variable resistor in response to a control voltage generated in response to the background level detected on a document. The output therefrom is a series of signal pulses, the heights of which are in direct relation to the level of the input signals.

3,702,448

IMPEDANCE MATCHED ULTRASONIC DELAY LINE WHEREIN ELECTRODES CONSIST OF BISMUTH AND INDIUM

Emil V. Boblett, Los Altos Hills, Calif., assignor to Ampex Corporation, Redwood City, Calif.

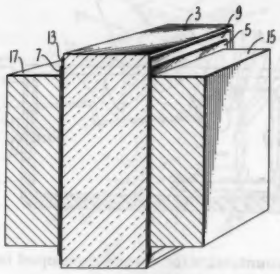
Filed Feb. 16, 1971, Ser. No. 115,219

Int. Cl. H03h *9/30;* **H04r** *17/00;* **H03h** *7/38*

U.S. Cl. 333—30 R **5 Claims**

A sonic delay line wherein electric impulses are converted

to acoustic impulses passed through glass and reconverted to electrical impulses, wherein the acoustic impedance of the



transducer is matched to that of glass utilizing an alloy of approximately equal parts of bismuth and indium, by weight.

3,702,449

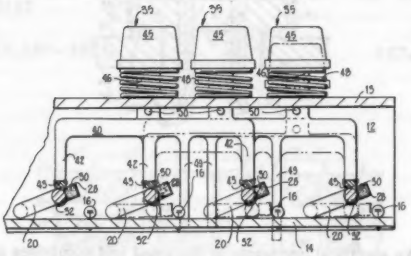
KEYBOARD ASSEMBLY

Carmeli Adahan, Berkeley, Calif., assignor to The Singer Company, New York, N.Y.

Filed Aug. 27, 1971, Ser. No. 175,527

Int. Cl. H01h *3/12, 41/08*

U.S. Cl. 335—206 **8 Claims**



A keyboard assembly having a plurality of reed switches mounted on a base member, a plurality of key assemblies mounted on a mounting plate and a plurality of movable switch actuators mounted adjacent the switches. Each switch actuator comprises a bail pivotally mounted above the base member, a magnet carried by the bail and a spring for biasing the magnet-bail assembly away from the associated switch. Each key assembly comprises a reciprocable slide, a key top, a bias spring and a stop member for limiting the amount of travel of the slide in the return direction. A resilient cushioning material is provided on the underside of each bail and a contact portion of each slide to substantially reduce mechanical noise and wear.

3,702,450

PRINTED CIRCUIT STEERING COILS

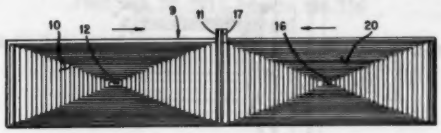
Robert T. Avery, Orinda; Glen R. Lambertson, Oakland, and Chester D. Pike, San Pablo, all of Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 11, 1971, Ser. No. 142,147

Int. Cl. H01f *5/00*

U.S. Cl. 335—213 **6 Claims**

A printed circuit steering coil on a flexible board for producing a charged particle beam deflecting magnetic field wherein rectangular, continuous planar spiral coils are etched on the circuit board opposite sides such that as each of at least two boards are bent into cylindrical shapes and disposed interiorly in a steel tube of high permeability permitting beam



passage, the coils provide for individual horizontal and vertical steering of the charged particles.

3,702,451

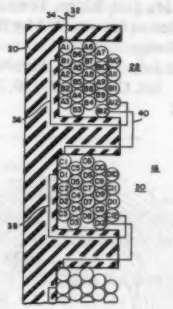
ELECTRICAL INDUCTIVE APPARATUS

Frederick H. Hofing, Sharpsville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 9, 1972, Ser. No. 224,703

Int. Cl. H01f *15/14*

U.S. Cl. 336—70 **5 Claims**



A transformer having a high-voltage winding wound with conductors having a small cross-sectional area, particularly with circular conductors. The winding is divided into sections by a supporting member and each section is wound with two conductors simultaneously. The two conductors are connected to each other and to the conductors of adjacent winding sections in a manner which increases the series capacitance of the high-voltage winding.

3,702,452

ELECTRICAL WINDINGS

Dean A. Yannucci, Niles, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

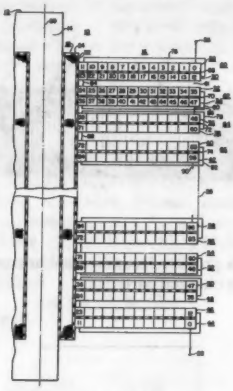
Filed June 8, 1971, Ser. No. 150,994

Int. Cl. H01f *27/08, 15/14*

U.S. Cl. 336—60 **29 Claims**

An electrical winding including a stack of axially aligned, continuous, pancake coils. The pancake coils are divided into pairs, and the coils of each pair are disposed closely adjacent one another to increase the capacitance between them. Ad-

jacent pairs are spaced by a dimension selected to enable cooling fluid to flow between the pairs. The coils in each pair are



directly interconnected, and the pairs of coils are interconnected, providing at least one electrical path through the winding.

3,702,453

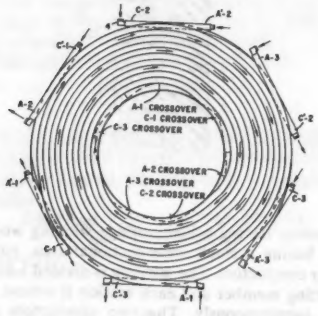
TEMPERATURE-COMPENSATED TRIMMING WINDINGS FOR WATER-COOLED MAGNET COILS

James N. Luton, Jr., Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed July 19, 1971, Ser. No. 163,680

Int. Cl. H01f *27/10, 27/28*

U.S. Cl. 336—62 **5 Claims**



A technique is disclosed for accurately adjusting the field shape of a high power density magnet system. The method uses to advantage the hollow tubular conductors that comprise the windings of the main coil. The trimming winding consists of an insulated wire (or wires) pulled through the hollow conductor (or conductors) whose relative field strength is to be altered. The amplitude and polarity of current in the wire is chosen to provide the desired field shape.

3,702,454

AMBIENT COMPENSATED TIME DELAY SWITCH

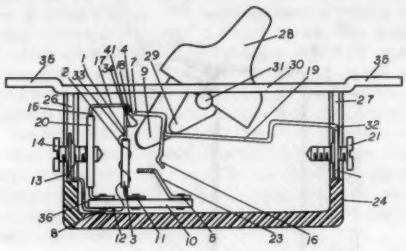
Horace D. Brown, Miami, Fla., assignor to Montec Corporation, Miami, Fla.

Filed Sept. 24, 1971, Ser. No. 183,513

Int. Cl. H01h *61/013, 71/16*

U.S. Cl. 337—77 **3 Claims**

A switch having a bimetal latch for locking a movable spring contact in closed circuit with a second contact, and a heating coil for activating the latch to release the spring contact. A second bimetal element engages and opposes the bimetal latch



and thereby counteracts the torque developed in the bimetal latch by changes in the ambient temperature.

3,702,455

ELECTRICAL CONNECTOR

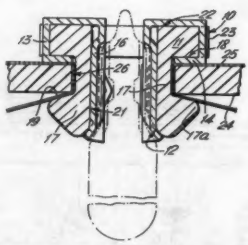
Terence Robert Raynor, and Peter Charles Terence Abbott, both of London, England, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 1, 1971, Ser. No. 111,420

Claims priority, application Great Britain, June 18, 1970, 29,570/70

Int. Cl. H01r *33/00;* **H05k** *1/12*

U.S. Cl. 339—17 C **1 Claim**



An electrical connector is disclosed and comprises a body part which is preferably formed as an extrusion and has a pair of contact parts secured thereto. Each contact part has a contact arm for engaging an electrical component such as a vehicle instrument and further has a contact surface located adjacent one of a pair of resilient legs formed on the body part whereby the contact surface and the leg cooperate to engage a conductive track on an insulating panel and make electrical connection therewith.

3,702,456

ELECTRICAL TERMINAL BLOCK FOR INTERCONNECTING A PLURALITY OF CONDUCTORS

George Allen Patton, Pfafftown, N.C., assignor to AMP Incorporated, Harrisburg, Pa.

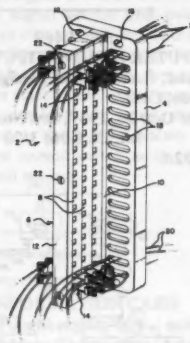
Continuation-in-part of Ser. No. 805,160, March 7, 1969, Pat. No. 3,617,983. This application April 7, 1971, Ser. No. 132,038

Int. Cl. H01r *9/00, 9/06*

U.S. Cl. 339—198 H **6 Claims**

Electrical Terminal Block comprises an insulating base member having a stack of individual clamping blocks mounted thereon. Individual terminals devices are contained in the stacks between adjacent clamping blocks and extend laterally on each side of the stack. The ends of the terminal devices are provided with terminal means in the form of inwardly extending slots which are adapted to receive insulated wires. The preferred form of the invention may also include means on each terminal device for trimming the end portion of a wire

concomitantly with insertion into the slot. Devices of this type are commonly used in the communication industry for per-



manently or semi-permanently interconnecting a multiplicity of conductors from a plurality of multi-conductor cables.

3,702,457

RELAY SOCKET

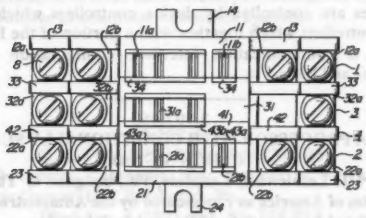
Teizo Fujita, 3-34, Naka, Tezukayama, Sumiyoshi-ku, Osaka, Japan

Filed March 15, 1971, Ser. No. 124,197. The portion of the term of this patent subsequent to Feb. 15, 1989, has been disclaimed.

Claims priority, application Japan, April 15, 1970, 45/32113

Int. Cl. H01r *9/00*

U.S. Cl. 339—198 G **4 Claims**



A relay socket for electrically connecting the terminals of a relay plug to external lead wires comprises at least two socket units of symmetrical configuration. Each socket unit has an open front side and a closed back side; and the two units are assembled in front-to-front relationship to one another, with their open sides in mutually facing relationship and with a separator plate interposed therebetween. Each socket unit includes a center base having an upper surface formed with a plurality of openings adapted to receive the terminals of a relay plug, and includes a pair of lead-out terminal mounting portions formed at the opposite sides of said center base. Internal recesses within each socket unit are adapted to receive substantially L-shaped metallic connecting plates each of which provides a lead-out terminal at one end thereof, disposed adjacent a lead-out terminal mounting portion of the socket unit, and the other end of each metallic connecting plate is fitted with a plug receiving terminal adapted to be positioned adjacent one of the openings in the center base of said socket unit. The socket configuration on one side of the separator plate can comprise a plurality of like units separably and complementarily fitted to one another in front-to-back relationship.

3,702,458

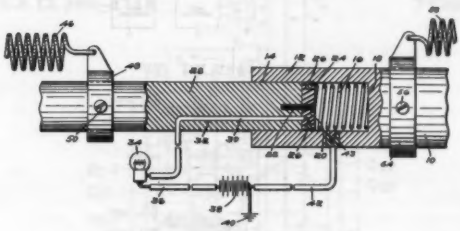
SIGNAL DEVICE TO INDICATE MALFUNCTION OF VEHICLE CLUTCH

Alfred J. Capachietti, Sr., 27 Bowen Avenue, Medford, Mass., and Daniel P. Capriotti, Sr., Pearl Street, Somerville, Mass.

Filed Sept. 20, 1971, Ser. No. 181,736

Int. Cl. G08b *21/00*

U.S. Cl. 340—52 R **8 Claims**



A clutch shaft has a cavity that receives a compression spring outside of which is a first electrical contact. A telescoping plunger rod movably extends into said cavity and it carries another electrical contact normally spaced from the first contact. When the clutch is worn or has any malfunction, such as being out of adjustment, the telescoping shaft moves farther into said cavity and at a predetermined point the two contacts meet, giving a signal such as illuminating a bulb or making a buzzing sound, to indicate the clutch needs attention.

3,702,459

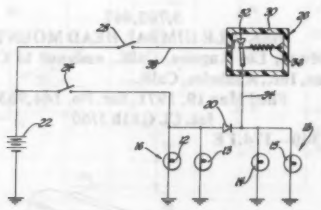
VEHICLE DECELERATION CIRCUIT

Michael L. Bauchan, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 3, 1971, Ser. No. 149,708

Int. Cl. B60q *1/44*

U.S. Cl. 340—62 **1 Claim**

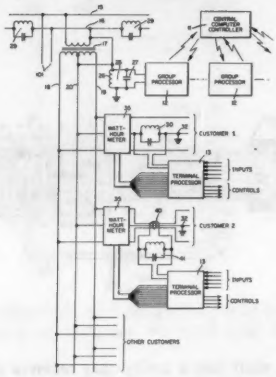


Apparatus for indicating deceleration and braking of a vehicle. The apparatus includes first and second groups of brake lamps each of which includes a first lamp on the left side of the vehicle and a second lamp on the right side of the vehicle. On application of the vehicle brakes all four of the brake lamps are energized to advise following motorists that the vehicle is being braked. When the vehicle is being decelerated at greater than a certain rate of deceleration while travelling faster than a certain speed only the second group of brake lamps is energized to indicate deceleration of the vehicle to following motorists.

3,702,460
COMMUNICATIONS SYSTEM FOR ELECTRIC POWER UTILITY

John B. Blose, 2195 Winding Way, Broomall, Pa.

Continuation-in-part of Ser. No. 846,336, July 31, 1969, abandoned. This application Nov. 30, 1971, Ser. No. 203,348
Int. Cl. H04b *13/02*; H04q *11/00*
U.S. Cl. 340—150 18 Claims

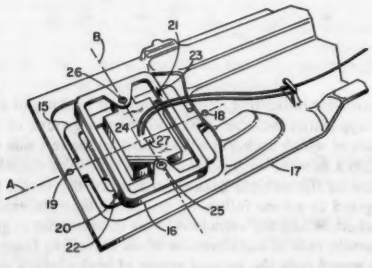


An electric power utility communication system is disclosed comprising a plurality of geographically distributed group control units and groups of terminal processor units, with each such terminal processor unit within a group coupled to a respective group control unit through the neutral conductor of the power utility distribution lines. Availability of the neutral as a communications link is achieved by inserting a parallel resonant circuit between the neutral and ground at each ground point in the system. Alternately, the signal generating and/or receiving equipment may be connected between the conventionally grounded neutral and deep earth ground, to develop the communications signal across the earth impedance. Communications information is transmitted over the neutral by coded high frequency signals to the terminal processor units which have electronic logic capacity to accept and perform command functions, interrogate meters, and transmit information back over the neutral to their respective group control units. Overall control is achieved by a central computer controller coupled to each group control unit by conventional transmission means, and which generates and receives coded signals through the group control units.

3,702,461
DISK FILE GIMBAL HEAD MOUNT

Gill Cantwell, Los Angeles, Calif., assignor to Century Data Systems, Inc., Anaheim, Calif.

Filed May 19, 1971, Ser. No. 144,903
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1 E 5 Claims

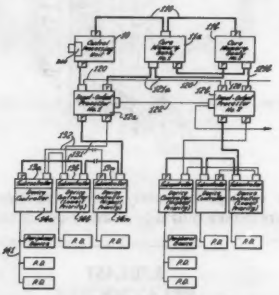


A rigid frame and gimbal spring may be utilized to form a hybrid gimbal arrangement for mounting a disc file head. Such a configuration will permit both normal loading and free rotation of the head about axes parallel with surface of the rotating disc.

3,702,462
COMPUTER INPUT-OUTPUT SYSTEM

Alfred W. England, Reseda, Calif., assignor to Delaware SDS, Inc., El Segundo, Calif.

Filed Oct. 26, 1967, Ser. No. 678,235
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 36 Claims

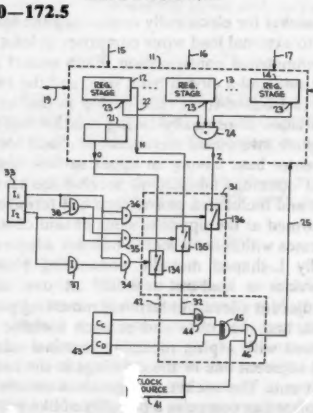


A computer system for digital computers is disclosed in which peripheral devices cooperate with "hardware" input-output processors (IOP) independent from the central processor (CPU) of the computer for handling the transfer of data between peripheral devices and memory which is also accessible to the CPU. Signal communication runs through special transmission facilities which include separate communication paths for the IOPs and CPU to memory, separate communication paths for control and data signals, and separate communication paths for determination of priority of operations among several IOPs and the CPU at memory, or between several IOPs at the IOP or between several devices at the device. The devices are controlled by device controllers which include subcontrollers which together with a portion of the IOPs provides a communication interface configuration between devices and IOPs.

3,702,463
DATA PROCESSOR WITH CONDITIONALLY SUPPLIED CLOCK SIGNALS

Robert J. Lesniewski, Lansdale, Pa., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 23, 1970, Ser. No. 100,996
Int. Cl. G06f *9/00*
U.S. Cl. 340—172.5 12 Claims



A digital data processor wherein operations are performed in response to a pulse from a clock source includes means for

deriving binary signals indicative of the state of various indicators within the processor. One of the indicator signals is selectively fed through a first switch having a single output lead. The indicator output signal is fed to a second switch responsive to a command signal source and pulses from a clock source. In response to one component of the command signal source having a predetermined value, pulses from the clock source are invariably fed through the second switch. In response to the other state of the one component, pulses from the clock source are selectively gated through the second switch, depending upon the relative values of binary signals derived from the first named switch and a second component of the command signal source.

3,702,464

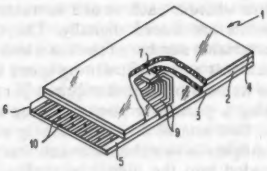
INFORMATION CARD

Paul P. Castrucci, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 4, 1971, Ser. No. 140,174

Int. Cl. G06k *19/00*; G11c *11/36, 17/00*

U.S. Cl. 340—173 SP **1 Claim**



An information card for credit and accounting system having a monolithic or solid state memory for storage of information responsive to computer controlled systems.

3,702,465

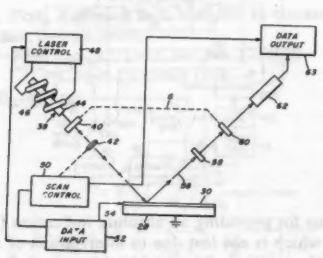
ELECTRO-OPTIC MASS MEMORY

James R. Cricchi, Catonville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 4, 1971, Ser. No. 168,913

Int. Cl. G11c *13/04, 11/34*

U.S. Cl. 340—173 LT **10 Claims**



A metal-nitride-oxide semiconductor memory device wherein information is written into the device by the combination of an applied electric field and a source of light, and thereafter read out by reflecting light from the surface of an area of the device whose oxide-nitride interface has been previously charged with information written into the device.

3,702,466

SEMICONDUCTOR INTEGRATED CIRCUIT MEMORY DEVICE UTILIZING INSULATED GATE TYPE SEMICONDUCTOR ELEMENTS

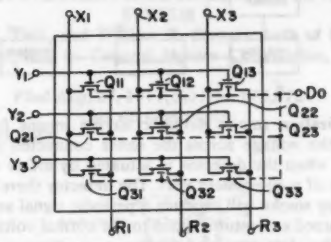
Masaru Nakagiri; Katsuhiro Onoda; Ryo Igarashi; Toshio Wada; Sho Nakanuma, and Tohru Tsujide, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 4, 1970, Ser. No. 86,748

Claims priority, application Japan, Nov. 5, 1969, 44/88993; Nov. 5, 1969, 44/88994

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 R **7 Claims**



A semiconductor integrated circuit includes a plurality of insulated gate field effect memory transistors arranged in a row-column matrix. Each of the memory transistors has an insulating film for establishing electron tapping centers. The source areas of the memory transistors are in the form of teeth-like projections which extend into the space defined between similarly formed projections in the memory transistor drain areas.

3,702,467

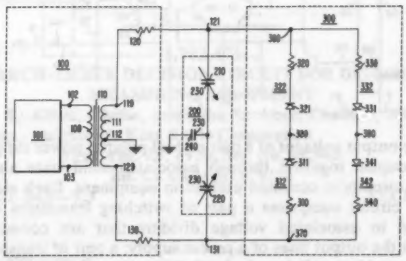
SHAFT POSITION SENSING DEVICE

George Melnyk, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 23, 1971, Ser. No. 201,281

Int. Cl. G08c *19/16*

U.S. Cl. 340—200 **6 Claims**

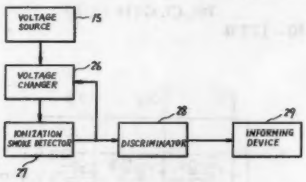


A shaft position sensing device provides a non-velocity sensitive, low noise output signal substantially free of any AC component. In one embodiment, a differential variable capacitor, constructed such that no commutation or slip-rings are necessary, is mounted to change capacitance with shaft rotation. This capacitor modulates a pair of AC signals which are 180° out of phase. For detection, the pair of modulated AC signals are applied to a ring demodulator circuit which provides, at a balanced output, a signal indicative of shaft position and substantially free of any AC component. The zero crossings and peaks of this signal, as well as its amplitude and polarity are indicative of shaft position.

3,702,468
FIRE ALARMING SYSTEM

Koji Sasaki, Tokyo, Japan, assignor to Nittan Company Limited, Tokyo, Japan

Filed July 28, 1971, Ser. No. 166,756
Claims priority, application Japan, Aug. 10, 1970, 45/69275; Aug. 10, 1970, 45/69278; Aug. 20, 1970, 45/72365; Aug. 31, 1970, 45/75628
Int. Cl. G08b 17/10, 29/00
U.S. Cl. 340—237 S 9 Claims

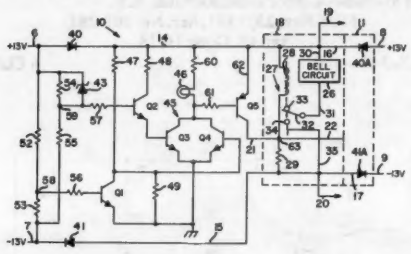


An ionization smoke detector having means for briefly reducing the voltage across the series connected ionization chambers when the detector is actuated by either smoke or the failure of a component part. The detector therefor, when actuated by smoke will produce a periodic signal as the voltage is reduced and returns again to the normal voltage. However, if the detector is defective a continuous signal is produced. Through the use of a discriminator connected to the detector the periodic signal will produce an alarm while the continuous signal will provide an indication of a faulty detector.

3,702,469
ALARM CIRCUIT FOR INDICATING FAILURE IN REDUNDANT POWER SUPPLIES

Joseph Golja, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories, Incorporated, Northlake, Ill.

Filed Sept. 3, 1971, Ser. No. 177,765
Int. Cl. F08b 21/00
U.S. Cl. 340—248 A 7 Claims

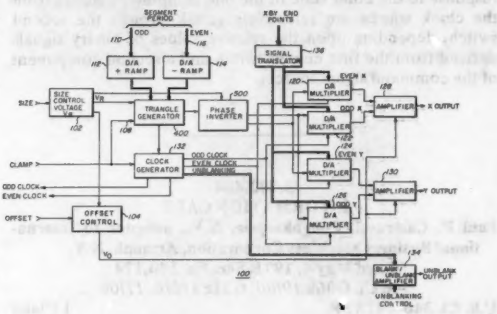


The output voltages of a pair of dual polarity power supplies are coupled together through associated solid state alarm-sense circuits to common utilization equipment. Each alarm-sense circuit comprises a pair of switching transistors connected to associated voltage dividers that are connected across the output lines of a power supply; a pair of transistors connected in parallel; and a lamp. The output lines supporting the same polarity voltages are connected together through steering diodes that prevent one supply loading the other. The switching transistors detect increases and decreases in supply voltages that are greater than prescribed amounts. In each alarm-sense circuit, the parallel connected transistors are responsive to the operation of the switching transistors to light the lamp to indicate failure of the associated power supply. Output signals of the alarm-sense circuits are connected to a bell for also producing an audio alarm when a power supply fails. A zener diode is connected to a voltage divider for causing a switching transistor to detect a supply failure when the absolute values of the opposite polarity supply voltages from an associated power supply increase at the same rate.

3,702,470
CONSTANT WRITING RATE CHARACTER GENERATION AND DISPLAY SYSTEM

Joseph E. Bryden, Framingham, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 30, 1970, Ser. No. 76,912
Int. Cl. G06f 3/14
U.S. Cl. 340—324 A 5 Claims

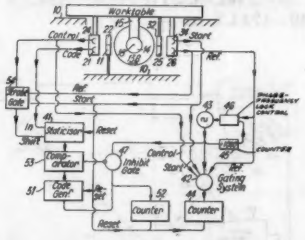


A character generator in which strokes are generated to form characters wherein each stroke is treated as a vector whose end points are stored digitally. The characters are formed from a variable number of strokes which are of varying periodicity such that a constant writing speed is obtained regardless of the number of strokes required per character; the time for writing a particular stroke is proportional to the stroke length. Two sets of digital to analog converters sum analog signal outputs in two channels such that digital control signals are loaded into the digital to analog converters alternately while X and Y axis beam steering and appropriate blanking and unblanking signals are employed for stroke writing.

3,702,471
MEASURING APPARATUS

Christopher John Kennedy; Alexander Turnbull Shepherd, and Graham Isaac Thomas, all of Edinburgh, Scotland, assignors to Ferranti, Limited, Hollinwood, Lancashire, England

Filed Jan. 5, 1971, Ser. No. 104,095
Claims priority, application Great Britain, Jan. 8, 1970, 902/70
Int. Cl. G08c 9/00
U.S. Cl. 340—347 P 11 Claims

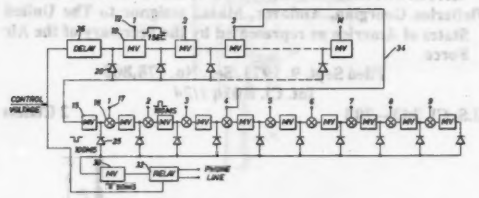


Apparatus for providing an absolute indication (that is, an indication which is not lost due to interruption of the supply source) of the position of a movable object, such as a machine tool, by means of a series of binary digital elements extending throughout the range of movement to form a chain-code sequence of dissimilar digital patterns. Each position of the tool is identified in dependence on the particular one of those patterns which is then in registry with a reading head, the identification being in terms of the number of electrical pulses needed to actuate a chain-code generator to produce a similar pattern.

3,702,472
PULSE GENERATOR AND ENCODER

Louis A. Stevenson, Jr., Houston, Tex., assignor to A-T-O Inc., Cleveland, Ohio

Division of Ser. No. 685,391, Nov. 24, 1967, Pat. No. 3,581,216. This application Oct. 12, 1970, Ser. No. 80,242
Int. Cl. G08c 19/18
U.S. Cl. 340—359 4 Claims



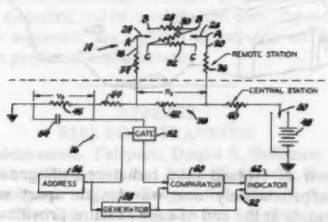
A circuit for encoding a multiple digit number, each digit represented by a plurality of pulse trains including a first plurality of serially connected monostable circuits corresponding to the number of digits in the number and a second plurality of serially connected monostable circuits interspersed with gate means. Selective connecting means provides means for applying control voltages from each of the first monostable circuits to the gate means. Connecting means connects each of the first monostable circuits to the first monostable circuit of the second plurality. The application of a trigger pulse to the first monostable circuit of the second plurality produces a pulse train output from the second plurality corresponding to the multiple digit by control voltage operation of the interspersed gate means by the first plurality.

A pulse generating circuit particularly useful as an encoder for automatic electronic dialing equipment including a plurality of serially connected first monostable circuits, a plurality of serially connected second monostable circuits with gate means connected therebetween, means connecting each of said first monostable circuits to the first circuit of said second monostable circuit, means for connecting each said first monostable circuits to a control terminal of said gate means, and means connected with each of said second monostable circuits for receiving a pulse train. Each of the first monostable circuits may correspond to a digit of a plural digit number, and each of the second monostable circuits may correspond to a value of each digit.

3,702,473
SEVEN-STATE RESISTANCE SENSING SUPERVISORY SYSTEM UTILIZING SINGLE POLE-DOUBLE THROW SWITCHES

William C. Fink, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,570
Int. Cl. G08b 1/08
U.S. Cl. 340—409 3 Claims

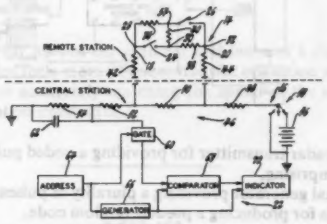


A supervisory circuit is located at a remote station which is to be monitored from a central station. The supervisory circuit includes first and second sensing switches each operable between a first position and a second position. In addition, the supervisory circuit includes first, second and third sensing resistors interconnected with the first and second sensing switches. A pair of sensing conductors connects the supervisory circuit from the remote station to the central station where a signal resistance is presented between the sensing conductors. The signal resistance indicates the state of the supervisory circuit by assuming one of seven different values each corresponding to a different one of seven possible states of the supervisory circuit.

3,702,474
SEVEN STATE RESISTANCE SENSING SUPERVISORY SYSTEM

William C. Fink, and William R. Stewart, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 27, 1971, Ser. No. 175,572
Int. Cl. G08b 1/08
U.S. Cl. 340—409 3 Claims

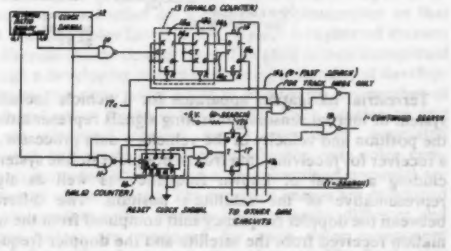


A supervisory circuit is located at a remote station which is to be monitored from a central station. The supervisory circuit includes first and second sensing switches each operable between an opened position and a closed position. In addition, the supervisory circuit includes first, second and third sensing resistors interconnected with the first and second sensing switches. A pair of sensing conductors connects the supervisory circuit from the remote station to the central station where a signal resistance is presented between the sensing conductors. The signal resistance indicates the state of the supervisory circuit by assuming one of seven different values each corresponding to a different one of seven possible states of the supervisory circuit.

3,702,475
SEARCH-TRACK DECISION CIRCUIT FOR DISTANCE MEASURING EQUIPMENT

John R. Alden, Olathe, and John L. Aker, Chanute, both of Kans., assignors to King Radio Corporation

Filed Aug. 28, 1970, Ser. No. 67,945
Int. Cl. G01s 9/14, 9/56
U.S. Cl. 343—7.3 12 Claims



A DME having means for facilitating the rapid identification of its own replies from a plurality of received replies

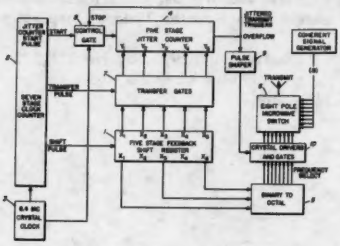
sequentially tests only the time/distance corresponding to the next occuring reply pulse received and uses a two counter digital concept to count both valid and invalid replies in making the decision to switch from the search mode to the track mode of operation.

3,702,476

DIGITAL PROGRAMMED TRANSMITTER

Fred E. Nathanson, Silver Spring, and David M. White, Adelphi, both of Md., assignors to The United States of America as represented by the Secretary of the Navy

Filed March 18, 1963, Ser. No. 266,112
Int. Cl. G01s 7/28
U.S. Cl. 343—17.1 PF **7 Claims**



4. A radar transmitter for providing a coded pulse transmission comprising,

a signal generator providing a plurality of pulses,

means for producing a pseudo-random code,

counting means connecting to said code means or providing control signals which are spaced in accordance with the code generated by said code means, and

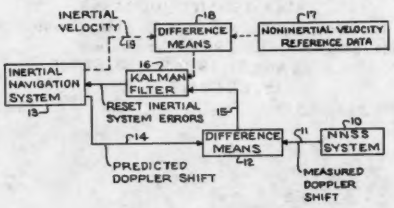
driving means for transmitting the output pulses from said signal generator in response to said control signals, thereby producing a transmission having a variable pulse repetition frequency.

3,702,477

INERTIAL/DOPPLER-SATELLITE NAVIGATION SYSTEM

Robert G. Brown, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed June 23, 1969, Ser. No. 835,819
Int. Cl. G01s 5/00
U.S. Cl. 343—112 C **10 Claims**



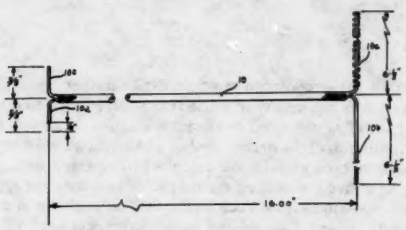
Terrestrial navigation apparatus for a vehicle includes a system of inertial sensors generating signals representative of the position and velocity of the vehicle, a data processor, and a receiver for receiving data from a doppler satellite system including a signal of known frequency as well as signals representative of the satellite's position. The difference between the doppler frequency shift computed from the information received from the satellite and the doppler frequency shift computed by the inertial system is modeled as an observable in a Kalman filter programmed into the data processor to generate a set of error signals representative of estimates of the errors in the position and velocity signals generated by the inertial sensors. The error estimate signals are then used to correct the errors in the inertial sensors. In one disclosed embodiment, the external, observed parameter is a discrete frequency; whereas in an alternative system, it is a frequency count.

3,702,478

ANTENNA AND ANTENNA COUPLING APPARATUS

Fleiterios Georgian, Andover, Mass., assignor to The United States of America as represented by the Secretary of the Air Force

Filed Sept. 9, 1971, Ser. No. 178,865
Int. Cl. H01q 1/24
U.S. Cl. 343—702 **2 Claims**



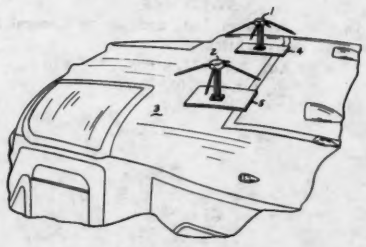
An antenna and antenna coupling apparatus is provided in which a receiving antenna is used with a super regenerative transponder receiver. The antenna comprises a coaxial cable which has the outer conductor stripped away from the inner conductor at one end and both the outer conductor and inner conductor bent so as to be at right angles. At the other end of the cable the outer conductor is also stripped away from the inner conductor and both are also bent at right angles. The coaxial cable passes through a shield enclosing the receiver and is soldered at the center of the bottom of the shield thus coupling the antenna to the receiver.

3,702,479

SPACE DIVERSITY ANTENNA SYSTEM FOR UHF SATELLITE COMMUNICATIONS FOR HELICOPTERS

Jerome W. Uhrig, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force

Filed July 7, 1971, Ser. No. 161,360
Int. Cl. H01q 1/28
U.S. Cl. 343—705 **3 Claims**

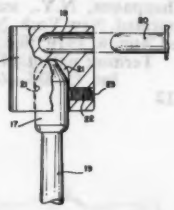


Two pair of crossed tube radiators orthogonally fed and spaced approximately one wavelength apart with coaxial choke loading at the end of each radiator provides an antenna system for transmitting and receiving electromagnetic radiation through the plane of the rotating blades of a helicopter on two widely spaced frequencies in the UHF communication band.

3,702,480
ELECTRICAL CONNECTOR FOR COUPLING AN EXTERNAL RECEIVER TO A MOBILE WHIP ANTENNA

John C. Byars, 1696 Prairie Road, Junction City, Oreg.

Filed March 31, 1971, Ser. No. 129,905
Int. Cl. H01q 1/32
U.S. Cl. 343—715 1 Claim

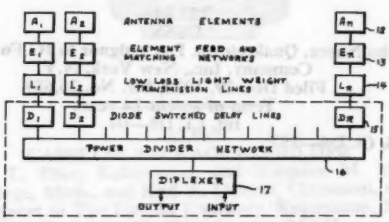


An antenna tip is disclosed for use in conjunction with a truck mounted antenna with the tip being configured to receive an antenna lead plug whereby a second radio may utilize the truck antenna. The tip removably receives the plug in frictional engagement to retain same yet permitting convenient disengagement. A modified form of the invention is in the form of an attachable tip structure mountable to existing antenna tips and having locking means to prevent loss during vehicle travel.

3,702,481
SATELLITE UNFURLABLE ANTENNA ARRAY

William B. Koller, Akron; Robert B. Higgins, Uniontown, and James W. Haylett, Akron, all of Ohio, assignors to The United States of America as represented by the Air Force

Filed July 16, 1971, Ser. No. 163,224
Int. Cl. H01q 3/26
U.S. Cl. 343—844 8 Claims



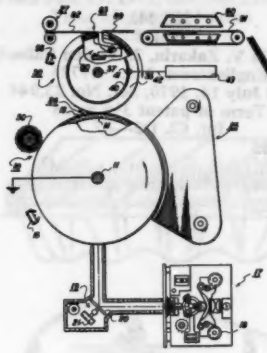
Disc on rod antenna radiating elements having bifilar helix feeds are arranged in a particular concentric circle type array configuration to achieve high gain, improved ellipticity and size and weight economies. Element spacing is adjusted to prevent element collecting aperture overlap. A collapsible segmented dielectric rod in combination with ring members of radial wire segments are utilized to provide an unfurlable array in one preferred embodiment.

3,702,482
BIAS ROLL TRANSFER

Charles Dolcimascolo, Fairport; Daniel S. Hoffman; Hugh L. Jones, both of Rochester, and James E. Mercik, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1970, Ser. No. 100,969
Int. Cl. G03g 15/04, 15/08, 15/16
U.S. Cl. 346—74 ES 11 Claims

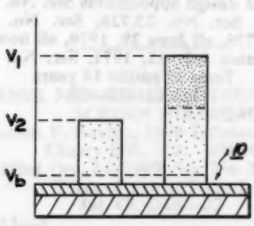
A biasable transfer member is herein disclosed suitable for use in transferring xerographic images from a photoconductor to a final support sheet. The member is adapted to electrically cooperate with the photoconductor to establish a directional force field therebetween capable of attracting toner from the photoconductor toward the member and features a structure which provides for a more efficient transfer operation while at the same time accurately matching the speed of the support sheet to the photoconductor.



3,702,483
COLOR RENDITION METHOD

Joseph Fantuzzo, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 23, 1970, Ser. No. 100,982
Int. Cl. G03g 15/04, 15/08; H04n 1/46
U.S. Cl. 346—74 ES 12 Claims

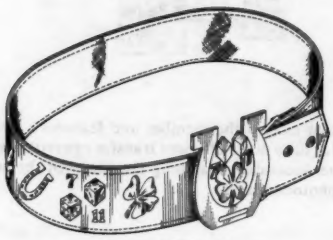


A simple xerographic color process is herein disclosed for reproducing functional color. An original, containing color information, is recorded on a charged photoreceptor so that each function color found in the original is registered thereon at a discrete charge density level. The plate is then transported through a developing station containing a plurality of developing units, the units being equal in number to the number of functional colors found in the original. Each developing unit has an electrical control means operatively associated therewith to control development whereby only color components recorded at or above a predetermined potential are developed within the unit. The recorded images are developed in a descending order of magnitude whereby different and distinct colors are produced for each color component recorded on the photoconductive element. The final color rendition is transferred, in a single operation, to a sheet of final support material.

DESIGNS

NOVEMBER 7, 1972

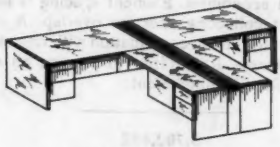
225,043
BELT
Melvin V. Zakarin, 23 Ogden Lane, Englishtown, N.J. 07726
Filed July 14, 1970, Ser. No. 23,944
Term of patent 3½ years
Int. Cl. D2—*07*
U.S. Cl. D2—385



225,044
BASEBALL MITT
Richard E. Bates, Ashland, Ky., assignor to Wilson Sporting Goods Co., River Grove, Ill.
Continuation of design applications Ser. No. 23, 724, Ser. No. 23,725, Ser. No. 23,726, Ser. No. 23,727, and Ser. No. 23,736, all June 29, 1970, all now abandoned.
This application July 12, 1971, Ser. No. 161,376
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—361

225,045
CHAIR
Frederick G. Kohl, Brooklyn Heights, and Robert K. Marceca, Chappaqua, N.Y., assignors to Rio Enterprises Incorporated, New York, N.Y.
Filed Aug. 6, 1970, Ser. No. 24,352
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D6—12

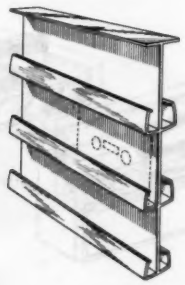
225,046
DESK
John Nance, Quakertown, Pa., assignor to JG Furniture Company, Inc., New York, N.Y.
Filed Dec. 29, 1970, Ser. No. 26,689
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—157



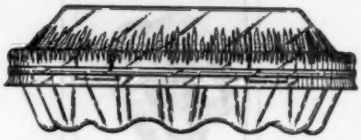
225,047
LOCK SET HANDLE
John Axel Tornoe and Robert Anthony Marotto, Redwood City, Calif., assignors to Schlage Lock Company
Filed Feb. 22, 1971, Ser. No. 117,875
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—138

225,048
BOTTLE
Howard Cooper, Suite 7707, 175 E. Delaware, Chicago, Ill. 60611
Filed Jan. 20, 1971, Ser. No. 108,243
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28

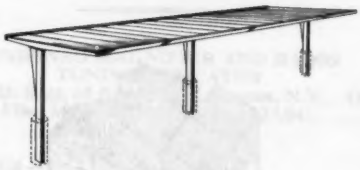
225,049
CASSETTE PACKAGING HOLDER
Larry L. Fites, Kalamazoo, and Kingsley M. Mann, Portage, Mich., and Karl A. Utrecht, Cincinnati, Ohio, assignors to The Upjohn Company, Kalamazoo, Mich.
Filed Sept. 29, 1970, Ser. No. 25,247
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—187



225,050
PACKAGING CONTAINER FOR A PIE OR THE LIKE
James N. Cannell, % The Quality Bakery, 50 N. Glenwood Ave., Columbus, Ohio 43222
Filed Feb. 17, 1971, Ser. No. 116,304
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—220



225,051
CARPORT
Jack A. Smithhart, Garland, Tex., assignor to Continental Steel Company, Garland, Tex.
Filed Sept. 4, 1969, Ser. No. 19,015
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1



225,052
PANEL MEMBER FOR STORM AND SCREEN DOORS
Joseph F. Bovino, 1000 Jefferson Ave., Cherry Hill, N.J. 08034
Filed Dec. 24, 1969, Ser. No. 20,631
Term of patent 7 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

225,053
PANEL MEMBER FOR STORM AND SCREEN DOORS
Joseph F. Bovino, 1000 Jefferson Ave., Cherry Hill, N.J. 08034
Filed Dec. 24, 1969, Ser. No. 20,635
Term of patent 7 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

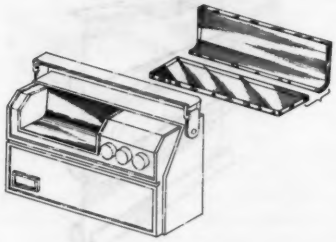
225,054
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., New York, N.Y. 11025
Filed May 26, 1971, Ser. No. 147,301
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

225,055
PRE-ASSEMBLED MODULAR HOUSING STRUCTURE
Edward D. Kelbish, 280 Vanderbilt Ave., New York, N.Y. 11025
Filed May 26, 1971, Ser. No. 147,304
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1

225,056
ELECTRIC HEATER
David N. Brooks, West Peabody, Mass., and Ronald E. Edin, Stratham, N.H., assignors to Sylvania Electric Products Inc.
Filed May 28, 1970, Ser. No. 23,185
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—77

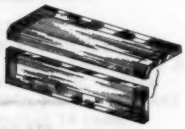
225,057
VISUAL MANIPULATIVE COORDINATION TOY
Eugene J. Majewski, 121 Elmore St., Park Ridge, Ill. 60068
Filed Mar. 16, 1971, Ser. No. 125,007
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1

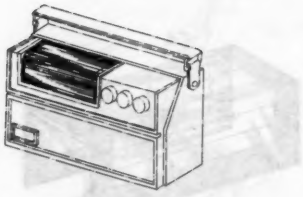
225,058
TRANSVERSE RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,922
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1



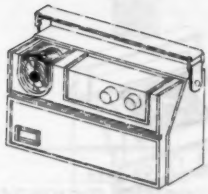
225,059
RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,923
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1

225,060
TRANSVERSE RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,924
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1

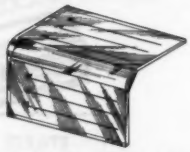


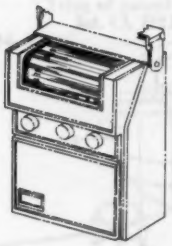


225,061
CIRCULAR RADIO TUNING FREQUENCY CONTROL WITH TRANSVERSE INDICATOR FACES
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,939
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1

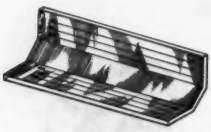


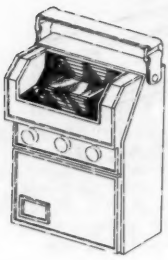
225,062
COMBINED MAGNIFIER AND RADIO TUNING INDICATOR
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,941
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1



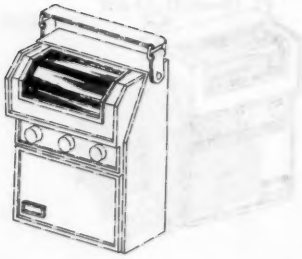


225,063
RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,942
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1

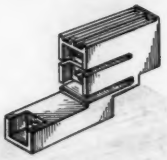




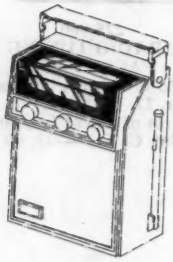
225,064
RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Mar. 12, 1971, Ser. No. 123,943
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1



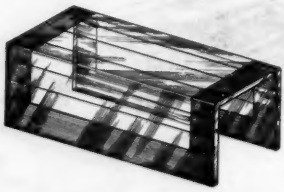
225,065
ELECTRICAL CONNECTOR HOUSING
Bruno Baumanis, River Forest, Ill., assignor to Molex Incorporated, Downers Grove, Ill.
Filed Apr. 1, 1971, Ser. No. 130,550
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



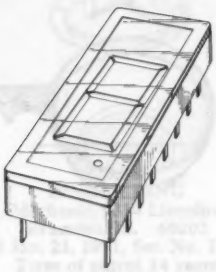
225,066
PORTABLE RADIO DUAL TUNING FACE INDICATOR PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed May 18, 1971, Ser. No. 144,700
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—1



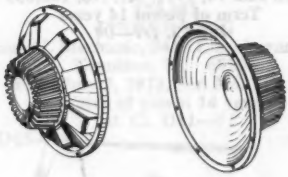
225,067
THREE SIDED RADIO TUNING INDICATOR FACE PLATE
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed May 18, 1971, Ser. No. 144,702
Term of patent 14 years
Int. Cl. D14—*03, 99*
U.S. Cl. D26—1



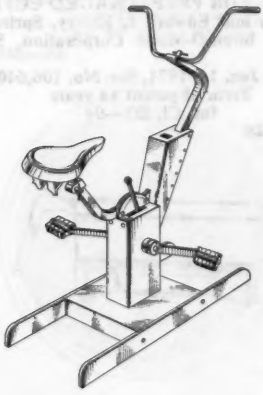
225,068
NUMERAL INDICATOR FOR COMPUTERS OR THE LIKE
Hiroshi Higashida, 1–2, 4-chome, Sakurajyosui, Setagaya-ku, Tokyo, Japan
Filed May 11, 1971, Ser. No. 142,425
Claims priority, application Japan Nov. 11, 1970
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—5



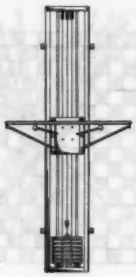
225,069
AUDIO SPEAKER
Edmond A. May, La Canada, Calif., assignor to MCA Technology, Inc., Los Angeles, Calif.
Filed Oct. 21, 1970, Ser. No. 25,580
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



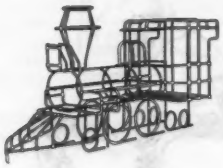
225,070
BICYCLE EXERCISER
Richard I. Proctor, 3201 Orange Grove Ave., North Highlands, Calif. 95660
Filed Apr. 12, 1971, Ser. No. 133,465
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5



225,071
EXERCISER OR SIMILAR ARTICLE
Richard I. Proctor, 3201 Orange Grove Ave., North Highlands, Calif. 95660
Filed Apr. 27, 1971, Ser. No. 138,015
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5

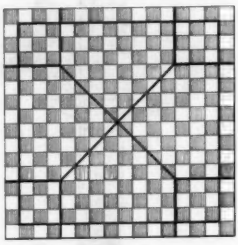


225,072
PLAYGROUND CLIMBING BARS
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.
Filed May 18, 1971, Ser. No. 144,697
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

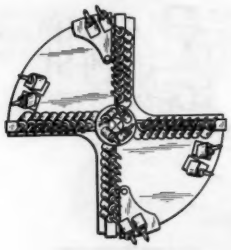


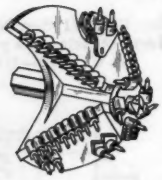
225,073
PLAYGROUND CLIMBING BARS
Steven A. Henning and Philip G. Miller, Anderson, Ind., assignors to American Playground Device Co., Anderson, Ind.
Filed May 19, 1971, Ser. No. 145,103
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5

225,074
GAME BOARD
Robert W. Dervishian, Richmond, Va., assignor to Chess, Inc., Richmond, Va.
Filed July 29, 1971, Ser. No. 167,543
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



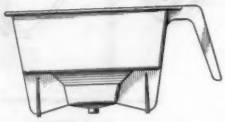
225,075
BORING AUGER FOR HORIZONTAL EARTH BORING MACHINES
Albert R. Richmond, West Salem, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio
Filed Aug. 6, 1970, Ser. No. 24,332
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D39—1



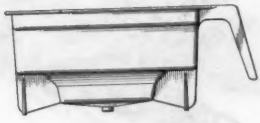


225,076
CUP
Karl Rune Persson, Halmstad, Sweden, assignor to Bila Cup AB, Halmstad, Sweden
Filed Sept. 22, 1970, Ser. No. 25,131
Claims priority, application Great Britain Mar. 23, 1970
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9

225,077
FUNNEL FOR PREPACKAGED COFFEE
John C. Martin and Edward J. Kniery, Springfield, Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Jan. 14, 1971, Ser. No. 106,639
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—26



225,078
FUNNEL FOR PREPACKAGED COFFEE
John C. Martin and Edward J. Kniery, Springfield, Ill., assignors to Bunn-O-Matic Corporation, Springfield, Ill.
Filed Jan. 14, 1971, Ser. No. 106,640
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D44—26

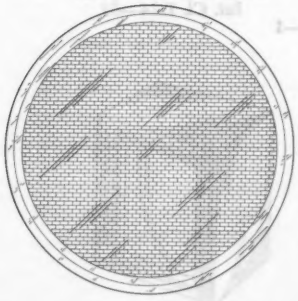


225,079
FINGER RING OR SIMILAR ARTICLE
Jean La Torre, 2720 Foster Ave., Brooklyn, N.Y. 11210
Filed June 7, 1971, Ser. No. 150,898
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

225,080
FINGER RING
Bernard I. Mechanic, 9314 Lincolnwood Drive, Evanston, Ill. 60202
Filed Jan. 22, 1971, Ser. No. 109,078
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

225,081
FINGER RING
Bernard I. Mechanic, 9413 Lincolnwood Drive, Evanston, Ill. 60202
Filed July 2, 1971, Ser. No. 159,586
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—10

225,082
TRAFFIC SIGNAL LENS
John R. Miles, Glenview, Ill., assignor to Gulf + Western Industries, Inc., New York, N.Y.
Filed Feb. 8, 1971, Ser. No. 113,517
Term of patent 14 years
Int. Cl. D26—*06, 05*
U.S. Cl. D48—32

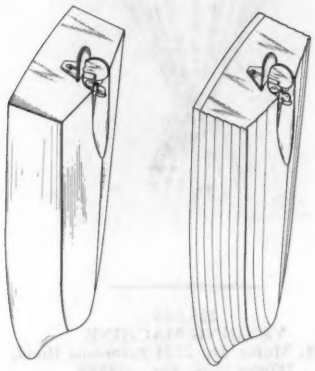


225,083
HEAD FOR A TIKI TORCH
James D. Reese, 11937 Avenue 274, Visalia, Calif. 93271
Filed Apr. 28, 1971, Ser. No. 138,380
Term of patent 14 years
Int. Cl. D26—*02, 05*
U.S. Cl. D48—24

225,084
VENDING MACHINE
Guy A. Morse, Jr., 2251 Poinciana Road, Winter Park, Fla. 32789
Filed Aug. 19, 1971, Ser. No. 173,356
Term of patent 7 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

225,085
PHONOGRAPH
Melvin H. Boldt, Glenview, Ill., assignor to Rowe International Inc., Whippany, N.J.
Filed Feb. 22, 1971, Ser. No. 117,860
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D56—4

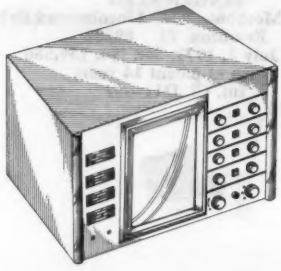
225,086
BOAT HULL
Robert B. Stuart, R.D. 4, Penn Yan, N.Y. 14527
Continuation-in-part of design application Ser. No. 14,307, Nov. 4, 1968. This application May 1, 1970, Ser. No. 22,781
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1



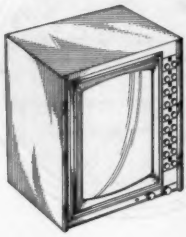
225,087
COMBINED REFLECTIVE HIGHWAY LANE DIVIDER AND ROAD MARKER
Dwight L. Haley, Tyler, Tex., assignor to Ferro Corporation, Cleveland, Ohio
Filed Feb. 24, 1971, Ser. No. 118,590
Term of patent 14 years
The portion of the term of the patent subsequent to Feb. 21, 1981, has been disclaimed
Int. Cl. D29—*02*
U.S. Cl. D72—1

225,088
THERAPEUTIC CAP
Ashsha East, 7140 N. Federal, Westminster, Colo. 80030
Filed July 2, 1970, Ser. No. 23,802
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D83—1

225,089
FOUR-CHANNEL MEDICAL CONDITION MONITOR
Lambert F. Lyons, 5132 White Oak Ave., Apt. 247, Los Angeles, Calif. 91316
Filed Dec. 15, 1970, Ser. No. 26,502
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D83—1



225,090
EIGHT-CHANNEL MEDICAL CONDITION MONITOR
Lambert F. Lyons, 5132 White Oak Ave., Apt. 247, Los Angeles, Calif. 91316
Filed Dec. 15, 1970, Ser. No. 26,503
Term of patent 7 years
Int. Cl. D24—*01*
U.S. Cl. D83—1



225,091

COMBINED CARRYING CASE ACCESSORY TRAY AND LID FOR A SEWING MACHINE OR SIMILAR ARTICLE

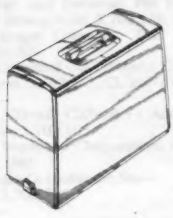
Robert S. Peets, Watchung, N.J., assignor to The Singer Company, New York, N.Y.

Filed Feb. 22, 1971, Ser. No. 117,588

Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D87—1



225,092

TIRE

Iain C. Mills, Sutton, England, assignor to Dunlop Holdings Limited, St. James, London, England

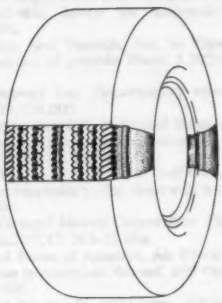
Continuation-in-part of design applications Ser. No. 22,172 and Ser. No. 22,173, both Apr. 1, 1970. This application Jan. 13, 1971, Ser. No. 106,320

Claims priority, application Great Britain Oct. 9, 1969; Oct. 17, 1969

Term of patent 7 years

Int. Cl. D12—*15*

U.S. Cl. D90—20



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF NOVEMBER, 1972

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Abbott, Peter Charles Terence: *See—*
Raynor, Terence Robert; and Abbott, Peter Charles Terence, 3,702,455.

Abrahamsson, Set Ingvar; and Persson, Per Helge. Apparatus for removing rubber rings from a mold. 3,702,138, Cl. 214-1.00r.

Adahan, Carmeli, to Singer Company, The. Keyboard assembly. 3,702,449, Cl. 335-206.000.

Adams, George F., to Universal Oil Products Company. Para-xylene recovery and production. 3,702,347, Cl. 260-674.00a.

Adams, Richard C.: *See—*
Price, Raymond E.; Tirrell, Clifford F.; Adams, Richard C.; and George, Robert W., 3,702,103.

Adams, William S., to Westvaco Corporation. Compartmented pad. 3,702,170, Cl. 229-15.000.

Addressograph-Multigraph Corporation: *See—*
Copeland, John S., 3,702,096.

Aebi, Hans Riehen: *See—*
Martin, Henry; Aebi, Hans Riehen; and Ebner, Ludwig, 3,702,363.

Aero-Flow Dynamics, Inc. (Wing Company Division, The): *See—*
Rohrs, Marvin K.; and Neary, Robert J., 3,702,156.

Aerojet-General Corporation: *See—*
Hankins, Ronald A.; Culver, Donald W.; and Scammon, Harrison B., Jr., 3,702,174.
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Ajinomoto Co., Inc.: *See—*
Ishida, Moriyoshi; Hori, Terutsugu; Otsuka, Yuzuru; Sato, Kunimitsu; Inoue, Katsuyuki; and Ogata, Yoshio, 3,702,341.

Aker, John L.: *See—*
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Albertson, Nathan E. Wrench holder. 3,702,136, Cl. 211-60.00t.

Alcan Research and Development Limited: *See—*
Bryson, Neil Burton, 3,702,152.

Alcock, David Gerald: *See—*
Williams, Alun Trefor Rhys; and Alcock, David Gerald, 3,702,247.

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Alden, John R.; and Aker, John L., to King Radio Corporation. Search-track decision circuit for distance measuring equipment. 3,702,475, Cl. 343-7.300.

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Li, Jorge Pengman; and Biel, John Hans, 3,702,327.

Alecci, Donald E.: *See—*
Sinnott, David J.; and Alecci, Donald E., 3,702,094.

Allergan Pharmaceuticals: *See—*
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Alley, David W. Hitch or coupling pin. 3,702,198, Cl. 280-515.000.

Allis-Chalmers Manufacturing Company: *See—*
Krutis, Edward V., 3,702,196.

Altmann, Conrad, to Eastman Kodak Company. Image development station. 3,702,108, Cl. 118-637.000.

Amana Refrigeration, Inc.: *See—*
Foerstner, Richard A., 3,702,386.

American Hydrocarbon Company: *See—*
Selin, Clifford E.; Lyon, Lloyd B.; Holbrook, Stanford T.; and Hammond, Francis H., 3,702,340.

American Optical Corporation: *See—*
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Raynor, Terence Robert; and Abbott, Peter Charles Terence, 3,702,455.

Ampex Corporation: *See—*
Boblett, Emil V., 3,702,448.

Anderson, Harold, Jr. Visual aid for trailer hitch. 3,702,029, Cl. 33-246.0as.

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Anikanov, Nikolai Ivanovich: *See—*
Dichinsky, Yakov Efimovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; Zax, Grigory Iosilfovich; Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; and Frumkin, Mikhail Evseevich, 3,702,186.

Antlfinger, George J.: *See—*
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Aoki, Akira: *See—*
Kosaka, Kenzo; Tsunewaki, Masami; Tanaka, Hideo; and Aoki, Akira, 3,702,055.

Arai, Hiroshi; Nakamura, Akira; Okamoto, Atutoshi; and Okumura, Shunji, to Toyota Jidosha Kogyo Kabushiki Kaisha and Nippondenso Kabushiki Kaisha. Anti-skid device for automotive vehicles. 3,702,205, Cl. 303-21.00a.

Arai, Tadashi; Asano, Kiro; and Yamada, Jun, to Kureha Kagaku Kogyo Kabushiki. Production of graphite fibers. 3,702,054, Cl. 57-157.032.

Archer, Alva I., to Honeywell Inc. Discretionary interconnection process. 3,702,025, Cl. 29-574.000.

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Avery, Robert T.; Lambertson, Glen R.; and Pike, Chester D., to United States of America, Atomic Energy Commission. Printed circuit steering coils. 3,702,450, Cl. 335-213.000.

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Bagwell, Benjamin J.: *See—*
Callender, Jack E.; Halbedel, Don Edward; Bagwell, Benjamin J.; Horning, James Leroy; Lissakers, Erik Axel; Long, Joseph Harold; and Schweitzer, Cameron C., 3,702,381.

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Farjon, Raymond; Farce, Jacques; Florent, Jacques; and Dumoulin, Michel, 3,702,314.

Baker, Charles P., Jr., to Omark Industries, Inc. Method of lining metallic walled carriers. 3,702,024, Cl. 29-407.000.

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Balinski, Henry A., to United States Gypsum Company. Cavity shaft wall. 3,702,044, Cl. 52-30.000.

Bannister, Brian, to Upjohn Company, The. Derivatives of lincomycin and its analogs and process. 3,702,322, Cl. 260-210.00r.

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Bauchan, Michael L., to General Motors Corporation. Vehicle deceleration circuit. 3,702,459, Cl. 340-62.000.

Bauer, Erich; Reichard, Franz; and Schwarz, Ferdinand, to Osterreichische Mineralolverwaltung Aktiengesellschaft. Process for the utilization of the energy content of the flue gas accrued in catalytic cracking plants. 3,702,308, Cl. 252-417.000.

Beard, William Q., Jr., to Ethyl Corporation. Halodehydrogenation catalyst. 3,702,311, Cl. 252-441.000.

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Dale, Edwin L., 3,702,231.
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Beets, Muus G. J.; and van Essen, Harm, to International Flavors & Fragrances Inc. 2-Methyl-2-(tertiary alkyl cyclohexyl) pentan-4-ones and processes. 3,702,343, Cl. 260-586.00b.

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Berg Electronics, Inc.: *See—*
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Betts, Max William; and Robinson, Frank, to Courtland Limited. Knitting method. 3,702,068, Cl. 66-176.000.

Bex, Lucien; Faure, Jean; and Vienet, Roger. Ion source having a uniform radial density. 3,702,416, Cl. 315-111.000.

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Big Dutchman, Inc.: *See—*
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Muller, Ernst; and Maurer, Albrecht, 3,702,150.

Blake, Paul Desmond; Johnston, Roy Douglas; Phelps, Brian; Chapman, Edwin Albert; and Bartlett, Ronald Leonard, to Murex Welding Processes Limited. Arc welding. 3,702,390, Cl. 219-146.000.

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Blatt, Leland F. Cylinder operated power clamp. 3,702,185, Cl. 269-32.000.

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Bloom, Stanley M.; Borror, Alan L.; Huyffer, Paul S.; and Macgregor, Paul T., to Polaroid Corporation. Diffusion transfer photographic processes and elements utilizing pH-sensitive agents to prevent fogging by extraneous actinic radiation during developmen. 3,702,244, Cl. 96-3.000.

Blose, John B. Communications system for electric power utility. 3,702,460, Cl. 340-150.000.

Blum, Conrad C., to Bommer Spring Hinge Co., Inc. Hold open assembly for checking floor hinge. 3,702,015, Cl. 16-55.000.

Boblett, Emil V., to Ampex Corporation. Impedance matched ultrasonic delay line wherein electrodes consist of bismuth and indium. 3,702,448, Cl. 333-30.00r.

Bocian, Harvey: *See—*
Marshall, Edwin L.; Bocian, Harvey; and Hauptman, Neil L., 3,702,027.

Bodenseewerk Perkin-Elmer & Co., GmbH: *See—*
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Schmitt, Hubert A., 3,702,088.

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Carothers, Charles H.; and Bogner, Philip W., 3,702,419.

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Blum, Conrad C., 3,702,015.

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Bloom, Stanley M.; Borror, Alan L.; Huyffer, Paul S.; and Macgregor, Paul T., 3,702,244.

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Brannan, Mary Ann F.: *See—*
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Braun, Klaus; Manthey, Kurt; and Welz, Bernhard, to Bodenseewerk Perkin-Elmer & Co., GmbH. Graphite tube cell assemblies for atomic absorption spectrometers. 3,702,219, Cl. 356-244.000.

Breed, Laurence W.; Elliott, Richard L.; and Rosenberg, Harold, to United States of America, Air Force, mesne. Method of making arylene modified siloxazanes incorporating cyclodisilazane structures. 3,702,317, Cl. 260-465.00p.

Breikss, Ivars P., to Honeywell, Inc. Frequency divider. 3,702,382, Cl. 179-100.20r.

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Brown, Horace D., to Montec Corporation. Ambient compensated time delay switch. 3,702,454, Cl. 337-77.000.

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Browning, Charles E., to United States of America, Air Force. Thermally stable heterocyclic anthraquinone polyimides and method for their synthesis. 3,702,318, Cl. 260-47.0cp.

Brubaker, Weldon L., to Berg Electronics, Inc. Method of manufacture for wire grip terminal. 3,702,104, Cl. 113-119.000.

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Busi, Ettore. Machine for the deposition of measured amounts of softened thermoplastic material into closure caps. 3,702,148, Cl. 141-67.000.

Byars, John C. Electrical connector for coupling an external receiver to a mobile whip antenna. 3,702,480, Cl. 343-715.000.

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Cantwell, Gill, to Century Data Systems, Inc. Disk file gimbal head mount. 3,702,461, Cl. 340-174.10e.

Capachietti, Alfred J., Sr.; and Capriotti, Daniel P., Sr. Signal device to indicate malfunction of vehicle clutch. 3,702,458, Cl. 340-52.00r.

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Carothers, Charles H.; and Bogner, Philip W., to Westinghouse Electric Corporation. Lightning arrester with pressure relief means. 3,702,419, Cl. 317-61.000.

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Coleman, Kelly R. Display device. 3,702,033, Cl. 40-129.00r.

Coleman, Lester E., to Lubrizol Corporation, The. Lubricant containing nitrogen-containing ester. 3,702,300, Cl. 252-51.50a.

Colling, Ronald L.; and Trenne, Myron U., to General Electric Corporation. Electronic push button sequencer. 3,702,424, Cl. 317-140.000.

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Cooper, James A., to United States of America, Atomic Energy Commission. Electrical surge diverting connector. 3,702,420, Cl. 317-61.000.

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Cumming, James Deans. Resin-bonded expansion shell. 3,702,060, Cl. 61-45.00b.

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De Blok, Jan F.; and Jansse, Leonard, to Koninklijke Nederlandsche Hoogovens en Staalfabrieken N. V. Method for deoxidizing effervescent steel. 3,702,151, Cl. 164-57.000.

De Corso, Serafino M.; and Carlson, Carl W., to Westinghouse Electric Corporation. Double wall combustion chamber. 3,702,058, Cl. 60-39.650.

Decker, Jacob, to Cincinnati Milacrom, Inc. Balancing device for roataing members. 3,702,082, Cl. 74-573.000.

Deines, John. Independently operable dual drive wheel riding power mower. 3,702,051, Cl. 56-11.300.

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Dichinsky, Yakov Efimovich; Radutsky, Grigory Avramovich; Kheifets, Rafail Efimovich; Zax, Grigory Iosilfovich; Anikanov, Nikolai Ivanovich; Grachev, Leonid Pavlovich; and Frumkin, Mikhail Evseevich, to Izdatelstvo "Izvestia". Rotary web printing machine 3,702,186, Cl. 270-6.000.

Diebold, James P.; and Eldridge, Judson B., to United States of America, Navy. Method for preparing polybutadiene acrylonitrile propellant and explosive materials and products thereof. 3,702,354, Cl. 264-3.00d.

Dixie-Narco, Inc.: *See—*

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Dulmage, Howard T.; Correa, Jose A.; and Martinez, Adelaido J. Certain microbial insecticides and methods of preparation thereof. 3,702,359, Cl. 424-93.000.
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Edelman, Alfred E. Dental implant extracting tool. 3,702,028, Cl. 32-61.000.
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Elcaness, Harold. Device for suctioning. 3,702,115, Cl. 128-276.000.
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Morris, Ewel J., Jr. Device for cleaning polluted air. 3,702,049, Cl. 55-278.000.
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Nakagiri, Masaru; Onoda, Katsuhiro; Igarashi, Ryo; Wada, Toshio; Nakanuma, Sho; and Tsujide, Tohru, to Nippon Electric Company, Limited. Semiconductor integrated circuit memory device utilizing insulated gate type semiconductor elements. 3,702,466, Cl. 340173.00r.
Nakamura, Akira: *See—*
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Olson, Walter C. Mobile vibratory cable plow. 3,702,062, Cl. 61-72.600.

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Osterreichische Mineralolverwaltung Aktiengesellschaft: *See—*
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Paulve, Marcel Luc Amedee. Apparatus for detecting the running of railway vehicles or the like. 3,702,396, Cl. 246-248.000.

Pavia, Edgar H. Manufacture of sodium hypochlorite. 3,702,234, Cl. 23-86.000.

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Peyrot, Jean-Pierre. Welding by electron bombardment. 3,702,389, Cl. 219-121.0eb.

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Pinckaers, Balthasar Hubert, to Honeywell Inc. Condition responsive modulating motor control system. 3,702,431, Cl. 318-471.000.

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Selvaag, Olav. Arrangement in or relating to a terrance floor and a method for the production of same. 3,702,045, Cl. 52-58.000.

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LIST OF DEFENSIVE PUBLICATIONS

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Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Achorn, Frank P., and F. Anderson, Jr. Ruminant direct feeding suspension supplement. T904,004, 11–7–72, Cl. 99—2.

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Bauer, William, Jr., and N. M. Bortnick. Laminar article with fused interface. T904,016, 11–7–72, Cl. 161—254.

Beardwood, Bruce Allan, B. S. Gorton, and P. E. Sample. Articles coated with a coating composition of ethylene-vinyl acetate copolymer. T904,013, 11–7–72, Cl. 117—76.

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Booker, Leslie G. S., deceased late of Rochester, N.Y. by N. G. Broderson, executor, and D. W. Heseltine. Photographic sensitizing dyes having improved solubility. T904,015, 11–7–72, Cl. 96—131.

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Mell, George P., to E. I. du Pont de Nemours and Co. Metal conductor having alternate layers of an aromatic polyamide enamel and an acrylic wire enamel. T904,006, 11–7–72, Cl. 117—218.

Millikan, Allan G., and E. J. Seus. Radiographic elements containing antihalation dyes. T904,017, 11–7–72, Cl. 96—84.

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Seus, Edward J.: *See*—
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Staniland, Philip A., and M. Whale, to Imperial Chemical Industries Ltd. Aromatic polymers containing a conductive filler. T904,012, 11–7–72, Cl. 252—503.

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LIST OF DESIGN PATENTEES

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Bovino, Joseph F. Panel member for storm and screen doors. 225,053, 11–7–72, Cl. D13—1.

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Katz, Maurice D. Circular radio tuning frequency control with transverse indicator faces (12). 225,061, 11–7–72, Cl. D26—1.

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La Torre, Jean. Finger ring or similar article. 225,079, 11–7–72, Cl. D45—10.
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Miles, John R., to Gulf & Western Industries, Inc. Traffic signal. 225,082, 11–7–72, Cl. D48—32.
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U.S. GOVERNMENT PRINTING OFFICE: 0—1972

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